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THE

ENTOMOLOGIST'S MONTHLY MAGAZINE:

CONDUCTED BY

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R. McLACHLAN, F.R.S.
H. T. STAINTON, F.R.S.

VOL. XV.

"I suppose you are an entomologist?

"Not quite so ambitious as that, sir. I should like to put my eyes on the individual entitled to that name. No man can be truly called an entomologist, sir; the subject is too vast for any single human intelligence to grasp."—OLIVER WENDELL HOLMES *(The Poet at the Breakfast Table).*

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THE

Entomologist's Monthly Magazine

VOLUME XV.

INTRODUCTORY PAPERS ON FOSSIL ENTOMOLOGY.

BY H. GOSS, F.L.S., F.G.S.

No. 1.

[*On the importance of an acquaintance with the subject: its bearing on the question of the evolution of insects, and the evidence it affords of the antiquity of their family types.*]

Although Entomology has attracted a larger number of workers than any other branch of Zoology, the fossil remains of the *Insecta*, and their affinities with existing genera and species of that class of the animal kingdom had, until a comparatively recent date, received scarcely any attention.

This is somewhat remarkable, because since the time of Cuvier, not only have the remains of the *Vertebrata*, the *Mollusca*, and the *Crustacea*, been carefully studied, both on the continent and in this country, but even the lowest forms[*] of animal life have not been neglected by Palæontologists.

It cannot, however, be denied that of the *Arthropoda* the *Insecta* are at least as interesting as the *Crustacea*; but although fossil insects were first alluded to as long ago as 1700, in Scheuchzers's "Herbarium Diluvianum," and in several later works by Sendelius, Schröter, and others, it was not until 1829, when M. Marcel de Serres[†] published an important work on the Fossil Invertebrates of the South of France, that they appear to have received serious attention. Ten years later, M. Brullé,[‡] in an inaugural address to the Faculté des Sciences de Paris, remarked on the importance of an acquaintance with fossil insects.

More recently, Professor Oswald Heer, of Zurich, most aptly styled by Massalongo "the Cuvier[§] of Fossil Entomology," has[||]

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[*] Such as *Foraminifera*, *Radiolaria*, and other classes belonging to the *Protozoa*.

[†] Géognosie des Terrains tertiaires, &c., Paris, 1829.

[‡] Sur le gisement des Insectes fossiles, et sur les secours que l'étude de ces animaux peut fournir à la Géologie. Paris, 1839.

[§] Studii Palæontologici, p. 11. Verona, 1856.

[||] Die Insekten-fauna der Tertiärgebilde von Œningen und von Radoboj in Croatien. *Leipzig, 1849* *Untersuchungen* über das Klima und die Vegetations-Verhältnisse des Tertiärlandes. *Winterthur, 1860.*

taught us that the clue which is furnished, by a study of the fossil remains of these animals, to a knowledge of the land and freshwater conditions of the earth, and of its climate and vegetation in past ages, is at least as valuable as, and in some respects more valuable than, that afforded by a study of the remains of other orders of the animal kingdom. Sir Charles Lyell[*] has also expressed an opinion to the same effect.

Probably the chief reason why fossil insects have received so little attention, as compared with the amount bestowed on the remains of other animals, is that they are, so far as present discoveries enable us to judge, very rare, except in a few localities;[†] and when found are frequently in such a fragmentary and imperfect condition as to render the identification of the genera, or in some cases even the orders to which they belong, a matter of the greatest difficulty.

The fact that insect remains, especially from the oldest rocks, are not unfrequently in an imperfect condition is not surprising; and it is rather a matter of astonishment that any traces of such fragile animals should have been preserved to us at all after the lapse of ages. In some cases, however, the strata in which insects have been found, and the circumstances under which they became embedded therein, appear to have been especially favourable to their preservation, rendering the determination of their species, or at least of the genera to which they belong, a matter of no more difficulty than in the case of living insects.

A further reason, probably, for the comparative neglect of this branch of Palæontology is, that even a superficial acquaintance with the various orders of insects, and their families and genera, is much less frequently possessed by Geologists and Palæontologists than a knowledge of the *Vertebrata*, the *Mollusca*, or the *Crustacea;* and although students of *Brachiopoda* amongst the *Mollusca*, and of *Entomostraca* and other classes of the *Crustacea*, can be counted by the score, there are, I think, scarcely half-a-dozen English Geologists who would be capable of forming an opinion as to the order even, to which a fossil insect, when discovered, should be referred.

On the continent, however, the study of fossil entomology is receiving, and has, during the last thirty years, received, a considerable amount of attention from Dr. Heer, Dr. Giebel, Dr. Hagen, Professor Germar, Dr. Goldenberg, M. Oustalet, and many others.

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[*] Lyell's Elements of Geology, 6th edit., p. 255.

[†] Such as Œningen, in Switzerland; Radoboj, in Croatia; Siebengebirge on the Rhine; *Corent and Menat, in Auvergne; Aix,* in Provence; Monte Bolca, near Verona, in Italy; and in *several places in North America.*

In America, too, in consequence chiefly of the impetus given to the investigation of the subject by the indefatigable Mr. Scudder, discoveries of fossil insects are almost daily being made by members of the United States Geological Survey.

There can be no doubt that when Geologists are more fully awake to the important deductions to be drawn from an examination of fossil insects, and a comparison of their geographical distribution with that of living species, the remains of this class of the animal kingdom will be more generally sought for and attentively studied.

Not only is this branch of Palæontology of interest and importance to the Geologist, but to the Zoologist also, as throwing some light on the question of the origin and development of insects; the comparative antiquity of the several orders, and their families and genera; the respective dates of their apparition on the geological horizon; and the affinities existing between living and extinct species.

Before proceeding to show how little direct evidence has as yet been furnished, by Palæontological researches, in support of the theory of the evolution of insects from some primitive types, it will be necessary to refer briefly to the opinions on this point of Professor Hæckel and Dr. Fritz Müller.

In the opinion of Hæckel, the *Insecta*, *Arachnida*, *Myriopoda*, and *Crustacea* must have had a common ancestor. The *Zoëa* or *Zoepoda*, which Hæckel supposes to have been the ancestral form of the *Crustacea*, are believed by him to have flourished early in the Silurian period, and he thinks that it was probably about the Devonian epoch that certain *Zoepods* were naturally selected for a terrestrial life, developed tracheæ, and became *Protracheata*, or progenitors of all the great tracheiferous group of the *Arthropoda*; whilst those which remained in the water were the ancestors of the branchiferous forms, such as crabs, lobsters, and shrimps. Dr. Fritz Müller* also is of opinion that the water-inhabiting and water-breathing *Crustacea* must be regarded as the orginal stem from which the other terrestrial classes, with their tracheal respiration, have branched off.

It is hardly just to these distinguished Naturalists to refer to their opinions in so cursory a manner; but my excuse for doing so is that it is not within the scope of this paper to discuss the question of the probable origin of insects, but merely to call attention to some of the facts bearing on the subject which have been gathered from Palæontological researches; and to show how little, by itself, the evidence at present obtained by such researches supports the opinions above quoted.

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* *"Facts for Darwin,"* translated from the German of Fritz Müller, by W. S. Dallas, F.L.S., *ch. xi, p. 120.*

It is a most remarkable fact that up to the present time we have no record of the discovery, even in the oldest fossiliferous rocks, of any forms which are clearly connecting links between existing types and any simpler organisms.

With the exception of about twelve specimens of *Pseudo-Neuropterous* insects, which Dr. Goldenberg* is of *opinion* should be placed in an extinct order, and which he has named *Palæodictyoptera*, the oldest known insects belong, most unmistakably, to the *Neuroptera* and *Orthoptera*. Sir John Lubbock,† although arguing in favor of the theory of evolution, admits that "the earliest known *Neuroptera* and "*Orthoptera,* though in some respects less specialized than existing "forms, are as truly and as well characterized insects as any now "existing; nor are we acquainted with any earlier forms which in "any way tend to bridge over the gap between them and lower groups."

The *Coleoptera* and *Hemiptera* are almost as old as the *Neuroptera* and *Orthoptera*; and even the comparatively modern orders—the *Diptera*, *Hymenoptera*, and *Lepidoptera*—have existed for ages.

From the fact that the family types of this class of the animal kingdom are of such vast antiquity, and that the remains of insects up to the present time discovered, even in the oldest strata, have all, with the few exceptions before mentioned, been referred to existing orders, it is evident that present Palæontological investigations do not furnish us with much direct evidence in support of the theory of the evolution of insects from lower forms, and we must look therefore to Embryology for light upon the subject.

It must be remembered, however, as Mr. Darwin‡ observes, that "the noble science of Geology loses glory from the extreme imper-"fection of the record. The crust of the earth with its embedded "remains must not be looked at as a well filled Museum, but as a "poor collection made at hazard and at rare intervals."

The force of these remarks is especially felt in the particular branch of Palæontology which is the subject of this paper. Although fossil insects have, in certain strata, and in a few widely scattered localities, been obtained in considerable numbers, they appear to be, as a rule, extremely rare and local.

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* *Fauna Saræpontana Fossilis,* 1877.

† *The Origin and Metamorphosis of* Insects, c. v, p. 86.

‡ *The Origin of Species,* ch. xiv, p 487 (1859).

The great antiquity, not only of the existing *orders* of insects, but even, in many cases, of their families and genera, as compared with the *Vertebrata*, and the very small amount of change which has taken place in them during the geological record is remarkable.

The truth of this assertion will be evident to any one who compares the fossil *Insecta*, even from the older formations, with the remains of animals of almost any other classes which existed during the same period.

Compare, for instance, the fossils of the English Lias with the existing orders of animals: the insect remains of this period have been referred by Professor Westwood* and the Rev. P. B. Brodie, to *Carabidæ*, *Telephoridæ*, *Elateridæ*, *Curculionidæ*, *Chrysomelidæ*, *Blattidæ*, *Gryllidæ*, &c., all represented at the present day; but with regard to the *Vertebrata*, where are the representatives at the present day of the *Saurians*, the flying lizards, and other gigantic reptiles of the Lias?

"When we consider," says Mr. A. R. Wallace, in his "Geographical distribution of animals," "that almost the only *Vertebrata* of this "period (*i. e.*, the Lias), were huge Saurian reptiles like the *Ichthyo-* "*saurus*, *Plesiosaurus*, and *Dinosaurus*, with the flying *Pterodactyles*; "and that the great mass of our existing genera, and even families, of "fish and reptiles had almost certainly not come into existence, we see "at once that types of insect form are proportionately far more "ancient. At this remote epoch, we find the chief family types (the "genera of the time of Linnæus) perfectly differentiated and recog- "nisable."

In the next paper, I propose to treat of the comparative age of the existing orders of insects, and the sequence in which they respectively appeared on the geological horizon.

Surbiton Hill: 1*st May*, 1878.

NOTES REGARDING SOME RARE *PAPILIONES*.

BY D. GREIG RUTHERFORD, F.L.S.

1. Papilio antimachus, Drury.

The recent addition to Mr. F. J. Horniman's collection of African *Lepidoptera* of two fine specimens of this handsome butterfly, has induced me to put together such information concerning it as I have been able to acquire, from various sources, during the last few years.

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* *See "A History of the Fossil Insects in the Secondary Rocks of England," by the Rev. P. B. Brodie, M.A., F.G.S.,* with introductory observations by Professor Westwood. London, 1845.

There appears good reason to believe, with Donovan, that the first example of *P. Antimachus* ever known to naturalists is that described and figured by Drury in 1782, in the 3rd volume of his "Illustrations of Exotic Entomology." It was taken by Mr. Smeathman at Sierra Leone in 1775, was purchased at the sale of his insects in 1805 by Mr. Macleay, and is now generally believed to be in the Museum at Sydney.

It is regarded as some proof of the extreme rarity of this species, that nearly a century elapsed before another specimen is known to have reached England. This was taken at Old Calabar by Miss Diboll, a missionary lady residing at Creek Town, and is now in the collection of Mr. Christopher Ward, of Halifax. It is in good preservation; and expands, if I remember rightly, a little over eight inches.

A few years later, Mr. W. C. Hewitson had the satisfaction of adding to his rich collection the third known example, an account of the capture of which at Gaboon appeared in this Magazine, March, 1874. It measures 7½ inches. Soon after, Mr. Hewitson received a second specimen from the same region. It is somewhat more highly coloured than the other, varies slightly in the shape of the markings and spots on the wings, and expands 8⅔ inches.

About the same time, Mr. Thomas Chapman, of Glasgow, came into possession of a specimen in rather a curious way. Learning from a friend that the captain of an African trading ship had brought home with him two large butterflies, he went to inspect them. He found the box containing them lying open in the middle of a circle of admiring children, one of whom had got hold of what he soon discovered to be a fine *Antimachus*, and was using it as a plaything! Mr. Chapman's emotions, until he had the specimen safe in his own hands, are more easily imagined than described. It is the largest example known, expanding $9\frac{6}{10}$ inches. It was taken at some locality far up the Gaboon river.

Not long after, another specimen, also I believe from Gaboon, came to England, and is now in Mr. Henley Grose Smith's collection.

The next specimen of which I have any knowledge was taken by the Rev. T. W. Thomson, one of the missionaries belonging to the Baptist Mission Settlement at Ambas Bay, during a journey he made last September through the country lying immediately to the north-east of Mount Camaroons. It expands 8¾ inches, and is almost perfect. A less perfect and rather smaller specimen was captured a few months ago by a native of the hill country lying north of the Sherboro' river. It measures 8⅛ inches. These two specimens are now in the possession of Mr. F. J. Horniman.

So far as I am aware, the above are the only specimens known to exist in any collection. With the exception of Drury's type and Mr. Henley Grose Smith's specimen, I have examined them all carefully. Those in the collections of Messrs. Ward, Hewitson, Chapman, and Horniman are all males; and, judging by Donovan's figure, made from Drury's type, and from the description given to me of Mr. Smith's specimen, I have no hesitation in concluding they belong to the same sex. Whether the female, as in so many of the African *Rhopalocera*, differs from the male, either in form or colour, or, like its allied species *P. Zalmoxis*, is in all respects similar to the male, is at present matter for conjecture, and we must wait patiently for some fortunate capture before we can speak with certainty regarding it.

From the measurements I have given, it will be seen that the species varies greatly in size. The differently shaped markings and spots on the wings are also subject to considerable variation.

In their "Species Lepidopterorum hucusque descriptæ," C. & R. Felder place *P. Antimachus* beside *P. Ridleyanus*, with which they consider it has a true affinity. An exhaustive examination of both has failed to convince me that they have any affinity which is based upon structure. They have, it is true, a general resemblance to each other in coloration and markings on the wings and bodies, but the antennæ of the two species are totally different. In *P. Ridleyanus*, and, indeed, in almost every one of the species of the group to which it has hitherto been referred, viz., group 15 of Boisduval, the antennæ are short and suddenly clavate, almost rounded at the points; whereas those of *P. Antimachus* are long, thicken gradually, and terminate abruptly. If this species has any close ally, I believe it to be *P. Zalmoxis*, which, though so different in colour, varies but slightly in the shape of the wings, and is possessed of exactly the same kind of antennæ. There appears to me to be good reason for concluding at present, and until we have further knowledge upon the subject, that these two species represent a transition group between the *Ornithopteræ* and the true *Papiliones*.

Of the habits of *P. Antimachus* nothing is known beyond what is recorded by Drury, as communicated to him by Smeathman. From his account we gather that it is seen only at mid-day, and flies very rapidly, frequenting only the upper branches of the trees, from whence it darts and glances from one branch to another, sometimes settling upon the lower branches, but never descending nearer to the ground *than the height of* eight feet. In curious connection with this account *of the habits of P. Antimachus*, there occurs a passage in a letter which I have just received from my friend Mr. George Thomson, of Victoria, Ambas Bay, who has recently been exploring the upper regions of Mount Camaroons. " One day (he writes) when sauntering " in front of the house where we lodged (about 5000 feet above the " level of the sea), I observed a large butterfly skimming gracefully " about the tops of the trees. It looked like a large *Acræa.* I watched " it, hoping it might descend within reach; but, after playing about " for some time, it went off in a downward direction, with a steady " sailing flight, but still keeping far from the ground. I could see it " for a long time clear over the trees. I have seen no *Acræa* nearly " so large, nor any other butterfly like it for size and mode of flight. " Could it have been *Antimachus*?" If it was really this fine species (and what else could it have been?) that my correspondent saw, his description would be a striking confirmation of Smeathman's account.

The fact that examples of *P. Antimachus* have been taken at various localities between Sierra Leone and Gaboon would seem to lead us to infer that the species has a wide range of distribution. But such a conclusion, I fear, would be rather premature. Although five localities are mentioned, they yet represent but three regions, which are widely separated from each other, and possess physical features presented by hardly any other portions of Western Africa. Sierra Leone and Sherboro' belong to a region of wooded hills and valleys. Old Calabar is so close to the north-western extension of the Camaroons range of mountains, that it may justly be considered part of the same mountain region. That portion of the Gaboon country from which there is every reason to be believed at least three examples of *P. Antimachus* have come, is also a region of wooded elevations. We thus find that the only specimens of this species of which we have any knowledge, have come, not only from hilly and mountainous regions, but from the only regions which can be called such lying within the great belt of forest which runs from Senegambia as far south as the estuary of the Congo. Are we to infer from this that the food plant of this insect only grows at certain elevations?

It has been suggested that one of the reasons why *P. Antimachus* has not been met with in other localities than those mentioned is, because no one has sought for it elsewhere, or has hit upon the exact locality, or collected during the right season. I can only remark that all this is just possible, but scarcely probable, when we consider that Mr. Skertchly made large collections in the forests of Ashantee,—that Mr. Crossley, one of the most diligent of collectors, explored the most accessible parts of Camaroons,—that the writer collected during seven months in the same region, eight in the country immediately north and east of Mount Camaroons, and four on the Cross River, north of the Old Calabar country, without ever capturing a single specimen of *P. Antimachus*. When West Africa is better explored than it is at present, we may come to know something more than we do now regarding the habits of this interesting species ; but, until then, what we *do* know leads me to conclude that it is not only one of the most local of African butterflies, but also one of the rarest.

Surrey House, Forest Hill :
May, 1878.

DESCRIPTION OF A NEW SPECIES OF BUTTERFLY FROM THE SANDWICH ISLANDS.

BY N. C. TUELY, F.L.S.

The Rev. T. Blackburn has sent over a new butterfly belonging to the family *Lycænidæ*, specimens of which were placed in Mr. Hewitson's hands to be figured and described. Unhappily, the state of Mr. Hewitson's health makes it very uncertain when he will be able to finish his work, so he thought it better that I should publish a short description of this species at once.

HOLOCHILA BLACKBURNI, *n. sp.*

Expands $\frac{13}{16}$—$1\frac{3}{16}$″. Shape of *Thecla rubi*, except that the costa of the fore-wing is not abruptly arched near the base, and that the abdominal edge of hind-wing slopes more regularly towards the anal angle, which is rounded, so that the incipient lobe which exists in *rubi* is wanting ; the hind margins of the wings are also quite entire.

♂. Above deep purplish-blue, in certain lights very dark olivaceous-brown (almost black). Under-side exactly like *rubi*, except that the whitish cilia are narrow and unspotted, and that the pale grey space on the inner margin of fore-wing is not tinged with brown.

♀. Above, fore-wing shining purplish-blue, with very broad costal and outer border black ; hind-wing black, with a patch of a similar blue to that of fore-wing occupying nearly the abdominal half of the wing, but not quite reaching either the abdominal margin, or the anal angle. Under-side as in ♂.

Thorax and abdomen (in both sexes) above, black, below, whitish ; slenderly clothed on both sides with fine white hairs. Antennæ slender, black, white-ringed, club tinged with brown. Type B. M.

This species is altogether a more slender insect than *T. rubi*, not only in the thorax, but also in the texture of the wings. The green scales *of the under-side* (of a rather different shade to those of rubi) *are very delicate*, and most of the specimens sent showed signs of much wear and tear. The only two females are somewhat rubbed, and the extent of the blue patch is rather uncertain, it is probably always ill-defined. The males do not vary, except in size; both the largest and smallest specimens were of this sex, the females both being medium sized.

Taken in a mountain pass in the Island of Oahu in March, "flying about in some numbers, frequenting the flowers of the Koa (a forest tree that grows in mountain localities). The insects were very tame, and when settled low enough, could be taken by the fingers, the majority, however, kept high up beyond the reach of any ordinary net."—T. B.

Although, for convenience sake, I have given a comparative description, this species has no real affinity with *Thecla rubi*, but belongs, as Mr. Butler informs me, to the genus *Holochila*, Feld., which is included by Kirby in his genus *Plebeius*. *Holochila* comprises *absimilis* (*Pleb.* No. 291 in Kirby's list) and a few other Australasian species, to none of which does *Blackburni* appear to be closely allied.

Mortimer Lodge, Wimbledon Park:
May 13*th*, 1878.

NOTES ON AFRICAN *HEMIPTERA-HETEROPTERA*.

BY W. L. DISTANT.

SCUTATA.

Genus *ASPONGOPUS*, Lap.

ASPONGOPUS NIGRO-VIOLACEUS, P. B., Ins., p. 83, Hem., pl. 7, fig. 4 (1805).

This species seems to have had some vicissitude in nomenclature. In the B. M. Catalogues it is placed in the genus *Cyclopelta*. As figured above, however, the 5-jointed antennæ are plainly visible, as they are also in H. Schäffer's figure of its synonym *Aspongopus unicolor*, Wanz., Ins., iv, fig. 433. Stål again considers it (Hem. Af., i, p. 216, and En. Hem., i, p. 83) as a variety only of *Aspongopus viduatus*, Fab. I am indebted to Mr. Rutherford for the examination, at different times, of a large number of specimens of both species, and, apart from *the very different* colour above, have always found the following well-*defined differences*:

Second and third joints of antennæ of equal length.

Abdomen above rufous. Long., ♂, 12 mm., ♀, 15 mm. ... . *nigro-violaceus.*

Second joint of antennæ somewhat longer than the third.

Abdomen above cyaneous. Long., ♂, 14—16 mm., ♀, 17—19 mm....*viduatus.*

ASPONGOPUS AFFINIS, *n. sp.*

Dark shining green, thickly and coarsely punctured; pronotum rugulose, scutellum transversely rugose. Frontal and lateral edges of pronotum, a small central spot at base of scutellum, basal half of border of corium above and below, and abdominal border above, luteous. Antennæ narrowly and obscurely fuscous at tip, 3rd and 5th joints equal, 2nd joint minute, 4th joint incrassated towards tip, shorter than the 3rd and 5th. Head strongly emarginate in front, with the lateral lobes broadly reflexed. The luteous border of the pronotum is widest in front, where it contains the two usual slightly raised prominences. The lateral edges are strongly reflexed. Membrane dark fuscous. Under-side coarsely punctate. Coxæ, trochanters, and lateral sides of prosternum, very broadly luteous. Abdomen below dark greenish-testaceous, much more prominently testaceous on disc, and green towards lateral borders. Femora obsoletely spinous, hind tibiæ somewhat dilated except at base and apex, dilated portion distinctly sulcate. Rostrum luteous at base.

♀. Long., 18 mm.

Isubu (W. Africa).

Allied to *A. patruelis*, Stål, from which it can be at once structurally distinguished by the broadly reflexed lateral borders of the pronotum.

ASPONGOPUS DIVERGENS, *n. sp.*

Above fuscous, shining, strongly rugose and punctate. Head and antennæ brassy-black. Head strongly emarginate in front, lateral lobes slightly sinuate, strongly reflexed. 2nd and 3rd joints of antennæ sub-equal, 4th somewhat compressed, obsoletely sulcated above, rather shorter than apical joint, which is the longest. Pronotum with the lateral angles moderately produced and rounded. Corium rather paler in colour. Membrane concolorous, but largely suffused with brassy-green, which in some specimens appears only at apex, and in others more so throughout the membranal area. Abdomen above castaneous, with the margins brassy-black. Under-side of body and legs brassy-black, thickly and finely (the legs more coarsely) punctate. Femora obtusely spinous, tibiæ strongly sulcated.

♀. Long., 21 mm.; exp. ang. pronot., 12 mm.

Camaroons. Isubu.

The prominence of the lateral angles of the pronotum sufficiently distinguishes this from any other known African species of the genus. Its somewhat elongate form and sulcated tibiæ also give it a characteristic which is slightly divergent from the typical forms of *Aspongopus*. In all essential characters, especially in the size and shape of the head and the broad and rounded scutellum, it agrees perfectly with that genus.

ASPONGOPUS MODESTUS, *n. sp.*

Ovate, bronzy-black. Head, pronotum and scutellum thickly and coarsely *punctured, the last transversely* rugulose. Corium thickly and finely punctured. *Head slightly emarginate* in front, with the lateral lobe obsoletely reflexed. Antennæ with the 2nd joint a little longer than the 3rd, 4th compressed, obsoletely sulcated, a little shorter than apical joint, which is the longest. Pronotum with an obscure transverse impression, about one-third from apex. Membrane fuscous. Under-side of body thickly and finely punctured, excepting on disc of abdomen, which is impunctate, and shining fuscous. Rostrum luteous, pitchy towards the apex. Coxæ luteous, anterior femora prominently spinous beneath.

Long., 11 mm.

Isubu.

Apart from colour, the nearest allied African form to the above would appear to be *A. pullus*, Stål.

Derwent Grove, East Dulwich:
May, 1878.

DIMORPHISM AND ALTERNATION OF GENERATIONS IN THE *CYNIPIDÆ*.

Simultaneously with the announcement from Mr. Fletcher published in our May No. (Vol. xiv, p. 265) that he had confirmed Dr. Adler's statement (see Vol. xiv, p. 44), so far as two of the supposed species are concerned, there appeared in the Pet. Nouvelles Entomologiques for May 1st, 1878, an article by our correspondent M. Lichtenstein under the title "Les Cynipides monoïques," in which he stated that he had obtained galls of *Spathogaster baccarum* from eggs laid by *Neuroterus lenticularis*.

Mr. Fletcher has since informed us that he also obtained two galls of *S. baccarum*, the produce of *N. lenticularis*, but the little oak upon which they were has died. He has now bred *S. vesicatrix* from the galls before alluded to.

We doubt not that all Dr. Adler's statements will be fully confirmed, instead of being "blown to the winds," as it was recently asserted they already had been.—Eds.

ON PARTHENOGENESIS IN THE *TENTHREDINIDÆ*, & ALTERNATION OF GENERATIONS IN THE *CYNIPIDÆ*.

BY P. CAMERON.

In a paper which I published in the "Scottish Naturalist" for October last, I pointed out that the ♂ of *Pœcilosoma pulveratum*, Retz. (*obesa*, H.), was quite unknown, and suggested that here we had a case of parthenogenesis. I am glad to be able to confirm this view by direct observation.

At the beginning of the present month (May), I found, in a small bottle containing two or three corks into which the larvæ of *P. pulveratum* had bored to pass the pupal state, two females of that species.

One was dead, but the other had apparently only recently emerged, I at once went out and cut a twig of alder, the food plant of the larva, and placed it and the saw-fly under a bell-glass in the sunshine. The insect, which had been hitherto very sluggish, and had remained motionless in one position, at once on feeling the sunshine became very lively, and flew up and down the enclosure. Soon it discovered the food-plant: examined it nearly all over, and ultimately fixed upon a young, half-grown leaf. At first it rested motionless in the middle of the leaf, then it came close to the border, fixed the outer legs along the edge, then raised the body up so that it was a little more than the height of the tibiæ from the surface of the leaf, which, it may be added, was a little bent on one side. In this position it remained for about a couple of seconds: then the abdomen was bent down, the saw was inserted into the leaf, and apparently was moved up and down but without being withdrawn out of the leaf; at least, I infer this from the motion of the abdomen. The saw was not put in straight, but was bent a little forward; the two leathery sheaths remained at right angles to the saw itself. After being in the leaf for a few seconds, the saw was withdrawn; the insect remained motionless for a second or two, and then the abdomen was bent down again, the saw inserted (but I think not very deeply) into the hole already made, and the egg deposited. During the egg-laying, the antennæ were a little raised above the height of the head, with a slight curve, and almost rigid. The whole operation lasted about eighty or ninety seconds. Several minutes elapsed before the next egg was laid. All were deposited on the thick half-grown leaves, sometimes singly, sometimes as many as three were placed on the same leaf. They were deposited close to, but not touching any of, the nerves, and on the under-side of the leaf.

Immediately after being laid, the eggs were quite invisible; but by twenty-four hours they had swollen up very much, and were easily recognised as greenish oblong elevations. Eight days after being deposited I extracted, with great trouble, an egg from its bed in the epidermis, and on placing it under the microscope, had no difficulty in seeing the future larva curled up inside, which showed conclusively that the eggs were quite fertile. I am not, however, sanguine of rearing many of the larvæ, because of the difficulty of keeping the plant fresh. The leaf, in drying, contracts and presses in the egg, which thus is killed. Experiments of this nature are best performed on growing plants, and are, of course, best carried out by one living in the country.

In the above-mentioned paper, I expressed views unfavourable to the occurrence of alternation of generations in the *Cynipidæ*. I now willingly admit that I then attached too much importance to mere negative observations, and I am very glad to say that I have this spring made some observations on *Neuroterus lenticularis*, which confirm those of Dr. Adler.

31, Willowbank Crescent, Glasgow: *May*, 1878.

Apatura Iris in the New Forest.—I am pleased to find by Mr. Goss's note (vol. xiv, p. 256) my opinion as to the scarcity of *A. Iris* in the New Forest confirmed, but I am inclined to think that his theory of the New Forest being too far westward for *A. Iris* is scarcely borne out by facts. From what I can learn at Lyndhurst, some 25 or 30 years ago *A. Iris* was plentiful in the New Forest, since which time, from some unexplained cause, it has almost disappeared there. Again, in the course of a conversation with Mr. Reeks, of Thauxton, near Weyhill, he informed me that the insect in question was, at the proper time, to be taken in some quantity in Collingbourne and Dole Woods, near Andover.

They have, to my own knowledge, been taken in the woods near Salisbury, although but rarely; therefore, I think we must look to some other cause than that suggested by Mr. Goss to account for its disappearance in the New Forest.—H. NEALE, 45, The Canal, Salisbury: *May 16th*, 1878.

Colias Edusa at Folkestone.—I saw a specimen of *Colias Edusa* on the borders of Lady Wood, at Folkestone, fly swiftly past me, on the 28th ultimo.—H. V. KNAGGS, 189, Camden Road: *9th May*, 1878.

On the habits of Biston hirtaria.—The observation recorded below may, or may not, bear upon the notes on habits of this species published by Mr. Silcock in Vol. xiv of this Magazine, p. 43.

On the morning of Friday, the 3rd inst., I noticed a ♀ on the trunk of a lime tree in this road, about nine feet from the ground: I think she was not there on the previous morning. She remained in precisely the same position up to this evening, when I dislodged her with my umbrella during a heavy rain, fearing the weather might prevent a more minute examination. This ♀ is in perfect condition, and as inert as is usual in the species: *but either she had previously laid all her eggs, or was originally barren;* the latter is perhaps the more probable. To my certain knowledge she had remained about 108 hours without shifting her position in the smallest degree. It is unusually late for the insect.—R. MCLACHLAN, Limes Grove, Lewisham: *7th May*, 1878.

Penthina postremana bred; a species new to Britain.—On the 7th October last, when searching for the larva of *Cidaria reticulata* amongst the wild-balsam (*Impatiens noli-me-tangere*), I split open a few stems of that succulent plant and found an active *Tortrix* larva, whitish-green, with black head. Mentioning this discovery to Mr. H. T. Stainton he was able to inform me, on referring to Kaltenbach's most valuable work, that *Penthina fuligana* had been bred by Herr Mühlig from larvæ which wintered in the dry stems of *Impatiens noli-me-tangere*. About the middle of April I split open some stems, and found the larvæ were quite lively. On the 4th inst., I bred two lovely specimens of *postremana*.—J. B. HODGKINSON, 15, Spring Bank, Preston: *May 8th*, 1874.

[The name *fuligana* is employed in Kaltenbach's work as being that used in *Staudinger and Wocke's Catalogue,* where *ustulana* and *carbonana* are quoted as *doubtful synonyms.*

Mr. Barrett has recorded in this Magazine (Vol. ix, p. 129) that *Antithesia ustulana* had been bred by Lord Walsingham, from larvæ found feeding in the stems of *Stachys palustris* in the Cambridgeshire fens; and Mr. Barrett informs us (Vol. x, p. 146) that *Ephippiphora nigricostana* has been confounded with *Antithesia fuligana,* from the fact that both feed in the same plant—*Stachys sylvatica.* Von Heinemann places *fuligana* next to *nigricostana,* and says that they come very close together. *Postremana,* which also feeds in the stems of *Impatiens noli-me-tangere,* follows almost as the next species to *fuligana* in Von Heinemann's work.—H. T. S.]

Economy of the larva of Ephippiphora nigricostana.—I first bred this insect from larvæ found at Twickenham in the winter of 1863. I met with it again in numbers in the neighbourhood of Doncaster in 1874 and 1875, and this winter have been successful in finding larvæ round Cambridge, wherever the food-plant *Stachys sylvatica* occurs.

The egg is evidently laid among the flowers, and the larva, on hatching, at once eats its way down the flower-stalk, and so down into the main stem, packing the space behind it very closely with its "frass." In October it may be found nearly full-fed at different heights in the stem; as winter approaches it descends, and in December is generally just above the level of the ground, and here it is to be found again in February; in the interval, however, it seems to eat its way underground, by mining the roots, or rather the horizontal suckers, which stretch from plant to plant; for these may in spring be found as closely packed with "frass" as were previously the higher parts of the stem. By April the larvæ have climbed up into the top of the plant, often through the old "frass" and into dried flower stems, scarcely as wide as themselves, and here the pupæ may be found *just below* a joint in the stem, fastened by a few threads, but otherwise quite unprotected.

The larva is of a pale lemon-yellow colour, with pale brown head; long and thin; attenuated towards the tail, and fond of wriggling backwards. If, by accident, a larva has been ejected from a broken stem and a fresh untenanted one be presented to its tail, it will slip into it as fast as an earth-worm into its hole.

Sometimes in early spring, and in the autumn, before the flower-stalk has lost its greenness, the larva itself bears a greenish tinge, owing to its having lately partaken of the green food of the root or fresh stem.

I think it is certain that the root is only used as winter pabulum, and perhaps not always even then by all larvæ, but only by those, which having found their way into a small or crippled flower-stalk, do not get enough in its substance to feed up upon.

In many cases the mined portion of the creeping root has a hole eaten out at the side, and this usually happens where the flower-stalks, which when dry are very brittle, have been broken off; it has occurred to me that the larva in this plight, finding itself unable to descend to the root in the ordinary way down the stem, drops to the ground from the broken piece and eats its way into the root, thus making these holes.

The pupa state does not appear to last more than two or three weeks, and (as I have said above) the pupa may often be found in parts of the stem scarcely wider than itself.

The perfect insects, both ♂ and ♀, are to be seen sitting at sunset on calm evenings in May and June on the upper surface of the *Stachys* leaves, and, *with care*, may be pill-boxed; but they are apt to drop or, on the slightest disturbance, to skip from leaf to leaf, and are easily lost either on the ground or among the grass. The males also fly briskly just before sunset along the hedge rows, where the *Stachys* grows.

I cannot help thinking that this insect will be found to be generally distributed all over the island.—W. WARREN, 51, Bridge Street, Cambridge: *April* 16*th*, 1878.

Elachista stabilella bred.—In February last I found a number of yellowish *Elachista* larvæ, mining the leaves of a common grass on the chalk soil at Newmarket, which produced in April *El. stabilella.*

This larva very nearly resembles that of *El. Gregsoni*, but is more yellowish: while the head and the 2nd segment are *pale brownish*: in fact, exactly like the description of *El. nigrella*:—the plate on the 2nd segment is of precisely the same shape as that of *Gregsoni.* I found in some cases as many as three or four larvæ together in the brown withered tips of the blades, from which they mine downwards in narrow pale yellow mines to the stem: the larva pupates at the base of the blade under an oval shaped web, just as *Gregsoni*: and the perfect insect seems to emerge over a lengthened period, as my first specimens came out in the middle of April, and many have not yet emerged: while I found *very young* larvæ still feeding on the 1st of May. Probably, the larvæ found in the dried tips of the blades had hibernated: but this point, together with the name of the grass itself, I must leave for further examination.—ID.: *May* 8*th*, 1878.

Stinging Lepidopterous larvæ.—With reference to the notes on luminous and stinging larvæ of *Lepidoptera* contained in the last Vol. of this Magazine, it may not be uninteresting to republish the following statement from Proc. Ent. Soc. (1841), p. 23:—" Mr. Yarrell exhibited a large and hairy caterpillar, evidently one of the " *Lepidoptera*, picked up in South America by Capt. Blakeney, R.N., who felt, upon " touching it, a sensation extending up his arm similar to an electric shock, of such " force that he lost the use of the arm for a time, and his medical attendant con- " sidered that his life was for some time in danger."—W. F. KIRBY, Dublin: *April*, 1878.

Description of the larva of Pyrameis Huntera.—Mr. Blackburn has sent eight specimens of *Pyrameis Huntera*, and a full description of the larva, which he found in the island of Maui, or Mowee. This makes only the fourth species of butterfly he has seen. He does not appear to have met with *cardui*, which, in the " Genera of Diurnal *Lepidoptera*," p. 205, is given as found in the Sandwich Islands. Possibly *Huntera* has been mistaken for it.

Description of the larva:—Head black, with white pubescence. Spiracular line greenish-yellow. Ground colour of each segment greenish-yellow, more or less mottled and transversely striped with black (both dorsally and on under-side). Each segment bears (especially about and below spiracular line) long whitish hairs. The third and fourth segments (counting the head as first segment) have each the following *in addition, viz., a broad*, velvety, black dorsal band, passing from spiracular line to *spiracular line, and bearing* four long black spines, each spine being itself covered with spines. The fifth segment is similar to the fourth, saving that it bears seven spines instead of four. Segments six to twelve are similar to five, except that each bears in addition two large white spots placed on the velvety dorsal band just in front of the spines (which run in a row along centre of band) and a little to left and right of the central spines. Most of the spines (especially those intermediate on each segment between the central one and the spiracular lines) spring from a more or less distinct red wart or protuberance. Legs and claspers all black, or nearly so. The last segment has no white spots, but is confusedly black and yellowish-green, and bears four spines (placed at the four corners of an imaginary square described on the segment) pointing backwards. Feeds on a species of "everlasting," which grows in sandy places near the sea. Pupa suspended by the tail—of an ashy colour, generally more or less marked with yellow.—N. C. TUELY, Mortimer Lodge, Wimbledon Park: *May 13th*, 1878.

NOTE.—In Smith & Abbott's Lepidop. Insects of Georgia, the food-plant of *Pyrameis Huntera* is stated to be *Gnaphalium obtusifolium.*

Natural History of Xylomiges conspicillaris.—It gives me great pleasure to be able to publish some account of the preparatory stages of this rare species, and for the ability to do this I have to thank Dr. Wood (of Tarrington), whose eyes were keen enough to detect a moth resting near the ground on an old gate-post, and for all the world looking like a splinter of the wood on which it was sitting; my friend had found others previously in similar situations, but this was the first female, and luckily it proved fertile.

The moth was found on June 4th, 1877, and she deposited her eggs in clusters on the sides of a chip box during the night of June 5th; in the cluster sent to me on the 9th, I found them lying three deep, but cannot say if in nature they would have been laid so thickly; possibly they might, for some species I know—such as *Tæniocampa miniosa* and *gracilis*—lay all their eggs in one dense heap.

The larvæ were hatched on June 14th and 15th, and ate about half the cluster of empty egg-shells before settling down on the food supplied—viz., *Lotus corniculatus.* The first moult took place on June 20th and 21st; the second on the 27th and 28th; the third about July 5th; the fourth from 12th to 15th of July; and the last was accomplished by the most advanced larva on July 26th—followed by others at intervals; after this some deaths occurred among my stock, and in addition to the food previously given—viz., *L. corniculatus* and occasionally *Polygonum aviculare*, I now gave them *Lotus major* and *Euonymus europæus*, and afterwards I learnt from Dr. Wood that I should have supplied them chiefly with the *flowers* of *L. corniculatus*, which he found his larvæ preferred to the leaves: the first two full-fed burrowed into the earth on August 5th, and were followed not long afterwards by some others, though two individuals chose to remain at last on the surface and pupate there without making any attempt to cover themselves; whilst those, which had entered the earth formed therein a thick and tough cocoon of earthy particles, looking as though they had been kneaded up with fluid, the result being of the texture of a *worm-cast, the interior very* smooth; the moths appeared on April 17th, 18th, 19th, *and 22nd, 1878.*

The egg is of a regular round shape, convex above, and depressed on the under-surface, the shell ornamented with numerous fine ribs and reticulations; when first laid the colour is a pale bluish-white, by the fourth day changed to a light pinkish-grey, with a zone round the middle and a blotch on the top of light brown, which deepening day by day makes the pale ground still paler by contrast, until the ninth day when the whole egg becomes uniformly of the hue of the bloom on a cluster of purple grapes, and in a few hours the larva is hatched.

The newly hatched larva has a very pale and transparent pinkish-grey body, and a pale brown head, the dorsal vessel showing blackish-brown through some of the segments, but after food has been taken and growth commenced the skin shows glossy light yellowish-watery-green, with minute black dots. After the first moult the colour changes to a more opaque bluish-green, still with the black dots, and with a paler widish dorsal and narrower sub-dorsal lines, the head of a yellower-green, sprinkled with black atoms; after the second moult the same tint of green was retained, with the dorsal and sub-dorsal lines as before, but now a still paler spiracular stripe appears, and in this stage—when the length is about ⅜ inch long—the larva is much like the young larva of *Tæniocampa gothica*, except that it is more slender and the pale lines are not so white nor so sharply defined. After the third moult the colours are much as before, but now the spiracular stripe is decidedly greenish-yellow, or ochreous-yellow, and the tubercular black dots are imperfectly ringed with whitish-yellow. After the fourth moult the general colouring, though deep and of sober richness for a time, gradually grows paler, and three varieties could be noticed, brownish-green, ochreous-green, and one or two light brown, the markings as before; when the larva is about an inch long the last moult occurs, and the size and colouring become that now to be described as belonging to the full-grown larva: the length is from 1½ to 1⅝ inches, the figure tolerably stout, cylindrical, yet tapering very little at either extremity, the eleventh and twelfth segments being rather the thickest, and all the divisions very slightly defined, the skin soft and smooth; the colour of the glistening head is pale pinkish-drab, with a blackish-brown streak down the front of each lobe, a finer streak at the side, and delicate reticulations on the other parts; the ground colour of the back and sides is ochreous-greenish-brown, very much but finely freckled with brownish-grey; the second segment is thickly freckled with dark grey-brown, and edged on the front margin with very dark grey, through which, rather distinctly, pass the fine thread-like dorsal and sub-dorsal lines, a trifle paler than the ground; but on the rest of the body they are of the ground colour merely relieved with outlines of grey-brown, and can only just be traced in their course, more or less interrupted, along a series of double dorsal diamond-shapes of close darkish grey freckling within a larger diamond outline of freckles on the back of each segment; each of the small tubercular spots, which are ranged in threes on either side of the dorsal region, is of cream-colour or pale drab, bearing a dot of blackish-grey on its upper margin; lower on the side is a single similar tubercular spot, below which the grey freckles form a dark contrasting edge to the paler widish spiracular stripe of reddish-drab or flesh-colour, most delicately freckled with whitish; the spiracles are pale flesh-colour, finely outlined with black; the side below them with the legs is of similar freckled ground-colour, but rather paler than the back, and the belly is unfreckled.

The pupa is nearly $\frac{3}{8}$ inch in length, and about $\frac{1}{4}$ in diameter, of somewhat dumpy shape, the head and thorax thick and rounded, the three flexible rings of the abdomen well cut at the divisions, their anterior ridges having punctate roughness, convexly tapered towards the rather blunt tip, which is furnished with four diverging shortish spines, the outer pair much the shortest; the colour is dark purplish-brown, and the surface shining.—WILLIAM BUCKLER, Emsworth: *April 30th*, 1878.

Clivina fossor myrmecophilous.—Whilst out collecting at Whinmoor, near Leeds, early in April this year, I came across several nests of *Formica flava*, De Geer, which I searched for myrmecophilous *Coleoptera*, and, to my surprise, found in them *Clivina fossor*, L., an addition to Mr. Janson's published lists.

I have found this beetle, singly, in several localities round Leeds this season, but here in a few moments, from two or three nests I took above a dozen specimens, picking them up with the wetted blade of a penknife, and then with difficulty, as the ants invariably seized them and attempted to carry them off; the loss of several specimens testifying to their success.—HY. CROWTHER, The Museum, Leeds: *May 6th*, 1878.

Phryganea obsoleta in Ireland.—I possess a specimen of *Phryganea obsoleta* captured at Killarney, in the summer of 1867, by Mr. John Ray Hardy, of Manchester. It is larger and darker coloured than my Scotch examples. See Ent. Month. Mag., Vol. xiv, p. 117.—BENJAMIN COOKE, Bowdon: *2nd May*, 1878.

Occurrence of Thereva fuscipennis, Meigen, an addition to the British List of Diptera.—In June and July, 1875, I captured, on the banks of the Bollin, one male and five females of a *Thereva*, which Mr. Meade and I have determined to be *T. fuscipennis* (Meig.). Both sexes are described by Schiner.—ID.

Review.

HEMIPTERA GYMNOCERATA EUROPÆ. HÉMIPTÈRES GYMNOCÉRATES D'EUROPE, DU BASSIN DE LA MÉDITERRANÉE ET DE L'ASIE RUSSE, décrites par O. M. Reuter. Tome premier, avec 8 planches. Helsingfors: Imprimerie de la Société Finlandaise de Littérature. 1878. Pp. 1—187. 4to.

Except in Fieber's Europaischen Hemiptera (1861), there is no work in which the European *Hemiptera-Heteroptera* have been treated as a whole, the works of other authors having reference to the product of more restricted limits, and although in that a great advantage was gained by concentrating into one view the labours of previous Hemipterists, yet the advance in knowledge of new species and of consequent views of classification since the date of publication of Fieber's work has been so great as to make the present work extremely welcome. The scope of the term "European" is here extended to include the area lying within the following limits: on the north—the Frozen Ocean; on the west—the Atlantic; on the south and east—the Atlas Mountains, the Sahara, the Arabian Gulf, the Syrian Desert, Mesopotamia, Chorassan or the Great Salt Desert of Persia, the Hindukoosh, the Bolortag, the Mus-tag, the Thian-Schan, the Altai and Daûr Mountains, and also the Seas of Ochotsk and Kamtschatka. Thus are included the following countries which are *geographically out of Europe*:—Algeria, the coasts of Tunis, Tripoli, and Egypt, Syria, Suez, Asia Minor, Transcaucasia, the north-west corner of Persia, Turkestan, Dsungaria, and Siberia. The reason given for this is that political and geographical limits are by no means identical with those of Natural History; and with respect to *Hemiptera* specially the author finds that the species of Asia, the North, and the Mediterranean countries are for the most part European, and that the fauna generally exhibits an essentially European type, although, as happens in certain parts of Europe, many species are found in one part which do not occur in another.

It is evident that the more comprehensive the area thus traced out the less exhaustive can any descriptive work be at this time, when so much of the ground has been absolutely unworked with regard to *Hemiptera,* yet there is no doubt already a great amount of species collected and waiting description or revision, and to this end the author seeks the assistance of the directors of museums as well as of amateurs.

With the rules to be observed in the application of specific names we may in main concur, but with respect to genera, however much they may be held to be *de rigueur*, there appear to be many logical reasons for objection. Modern genera, even with the most rigid and fine-drawn definitions, are the most unstable idealisms, not only of authors, with regard to the creations of others, but also to those of themselves at some recently previous time, of which this work exhibits many examples (*e. g. Psallus*); but this is not the place for a dissertation on the subject, and we reserve for another opportunity some remarks we are tempted to offer. It would, however, be very desirable if, in a work of this kind, the faulty orthography of many generic names were corrected.

The work begins with the *Capsidæ*, the reason given by the author being that he regards them as the lowest in the system, that he has resolved to work from the lowest to the highest, moreover, that these inferior groups specially require revision, and that he is specially acquainted therewith: 148 species are described, forming the Division *Plagiognatharia,* Reut.

The preface is written in French, and the descriptive matter in Latin; the printing, done at Helsingfors, is clear and distinct; the plates, engraved and coloured in Paris from Fieber's drawings, are excellent, and the entomological world may congratulate itself that it will here reap the benefit of the labours of a very competent authority.

ENTOMOLOGICAL SOCIETY OF LONDON: *April 3rd,* 1878.—H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

Miss Eleanor A. Ormerod, of Spring Grove, Isleworth, was elected a Member.

Mr. Grut exhibited, on behalf of the Rev. T. A. Marshall, a collection of insects captured by the latter in the West Indian Islands of Antigua, Martinique, &c.

Mr. F. Smith exhibited a series of examples of a Harvesting Ant, apparently identical with *Myrmica barbata,* sent to Mr. Darwin from Florida, by Mrs. Mary Treat. These were remarkable for the variation that existed in the teeth of the mandibles, some having acute teeth, others rounded teeth, and in others the teeth were obsolete, but no intermediate conditions were present, and he had no information as to whether the forms inhabited different nests or otherwise.

Mr. Berens exhibited a pair of *Thestor mauritanica,* Staudinger, from the Atlas *Mountains.*

Mr. McLachlan exhibited a Coleopterous larva, sent by Dr. Kirk from Zanzibar, where it was doing great damage as a coffee-borer. It pertained to either the *Buprestidæ* or Longicorns (probably to the former), and its mode of life was remarkable, inasmuch as it appeared to establish a communication with the air by cutting a series of small, nearly equidistant, holes (each, externally, about the size of the hole of an *Anobium*) along the sides of its gallery, commencing internally rather large, but gradually decreasing in diameter until the bark was reached. Various surmises (such as the presence of parasites, &c.) as to the object of this singular habit were put forward, but Mr. McLachlan inclined to the opinion that the holes were really intended for ventilation.

Mr. W. C. Boyd exhibited an example of *Oxyptilus lætus* taken at Deal, in June, 1869, and remarked on apparent differences between it and the form captured in Norfolk.

A paper by the Rev. T. A. Marshall, on the entomology of the Windward Islands, was read by the Secretary.

The Rev. H. S. Gorham communicated the description of a new species of *Cleridæ*, with corrections of synonymy, &c.

Dr. Sharp communicated a paper on some *Nitidulidæ* from the Hawaiian Islands.

The Secretary read a paper by Mr. Mansel Weale (accompanied by illustrations) on South African insects, with especial reference to those infesting *Acacia horrida*, and their protective resemblances, &c. Mr. Wood-Mason exhibited the insects referred to in the paper, and alluded to the resemblance of one of the species of *Mantidæ* noticed in the paper to bird-droppings. The larva of a species of moth of the family *Phycidæ* had the singular habit of forming long cases, like the thorns of the *Acacia*, and the resemblance was strengthened by the larva attaching leaflets at the end, so as to cause the cases to bear a still greater resemblance to young thorns. With regard to resemblance between ants and spiders, Mr. Meldola thought the case should be referred to the category of aggressive mimicry, the spiders feeding upon the ants and flies attracted by the sweet secretions of the *Acacia*.

Mr. Swinton communicated a paper on "display and dances by insects."

Mr. Slater communicated a paper on the "secondary sexual characters of insects," with especial reference to the development of horn-like processes and elongated mandibles in the males of *Coleoptera*, alluding to the theories advanced in explanation of the causes and purpose of the growths.

1st May, 1878.—H. W. BATES, Esq., F.L.S., President, in the Chair.

H. J. Elwes, Esq., F.L.S., of Preston House, Cirencester, was elected a Member, and P. Cameron Esq., of Glasgow, was elected a Subscriber.

Mr. Dunning drew attention to the fact that the Meeting marked the 45th Anniversary of the foundation of the Society.

Mr. Distant read a paper on some *Hemiptera-Homoptera*, with descriptions of new species, in which he remarked on the uncertainty of generic nomenclature as a basis upon which to found theories of geographical distribution. He exhibited a specimen of *Tetrodes bilineata*, Walker, as a remarkable instance of the power some insects appeared to have of resisting damp; that same specimen having been in a damp relaxing box for over four months without injury.

NEW SPECIES OF GEODEPHAGOUS *COLEOPTERA* FROM NEW ZEALAND.

BY H. W. BATES, F.L.S.

In the paper on the Geodephagous *Coleoptera* of New Zealand, which I published in 1874, eighty-nine species were catalogued as belonging to the islands. To this number must be added three species described by Captain Broun in the Trans. of the New Zealand Institute, nine species by myself in Entom. Monthly Mag., Jan. and Feb , 1878 (Vol. xiv, pp. 191—196), and eighteen in the following pages, making, in all, one hundred and nineteen species now known as belonging to the New Zealand Fauna in this department.

CICINDELA AUSTROMONTANA, *n. sp.*

Oblonga, supra saturate olivacea, opaca, subtilissime sculpturata, fere lævis; elytris lunula humerali, fasciaque brevi mediana vix curvata, per marginem cum lunula apicali connexa, albis: labro valde transverso, margine antico fere recto, medio tridentato; capite subtilissime strigoso; thorace lateribus rotundato, postice magis quam antice angustato: elytris apice rotundatis, suturâ spinosa, dorso æqualiter subtilissime granulatis: corpore subtus femoribusque æneis, sparsim albopilosis. *Long.* 5 *lin.*, ♂.

Closely allied to *C. Feredayi*, from which it may be distinguished by the form of the anterior edge of the labrum. This, in the ♂ of *C. Feredayi*, is angularly produced in the middle, and ends in a stout tooth; but in the same sex of *C. austromontana*, it is not produced, forming in the middle a sharp tooth with a more obtuse one on each side. Besides this definite structural character, the new species differs in being more parallel-sided, duller in colour, and in the sculpture of the elytra consisting of granules instead of punctures. The usual row of large green punctures is not visible. The white markings are not very different; but the white margin is interrupted at the end of the humeral lunule, and the median belt is not bent and prolonged posteriorly. The forehead and thorax have a few long white hairs.

Castle Hill, Eastern slope of New Zealand Alps, Canterbury (C. M. Wakefield); two examples.

PHYSOLÆSTHUS INSULARIS.

Oblongus, subdepressus, piceo-niger, elytris thoraceque marginibus rufescentibus, capite thoraceque subopacis, illo antice late concavo; thorace transversim quadrato postice modice angustato, angulis obtusis, ibique margine elevato, margine postico late rotundato; elytris politis, striatis, interstitiis convexis. *Long.* 2¼ *lin.*

Considerably smaller than either of the Australian species already described of this genus; but agreeing in almost every other respect with *Ph. australis* (Chaudoir). It bears a strong resemblance to the European *Badister peltatus*, from which its swollen labial palpi at once distinguish it. It is smaller, and has a shorter thorax, the hind angles having a broad smooth fovea, from which springs a strong bristle. The pale margin of the elytra is confined to the reflexed rim.

Canterbury Province (C. M. Wakefield).

LECANOMERUS OBESULUS.

Oblongo-ovatus, convexus, subæneo-niger, nitidus, antennis basi, palpis, tibiis (apice piceo excepto) tarsisque apice rufotestaceis; marginibus inflectis thoracis et elytrorum plus minusve rufescentibus; thorace transversim quadrato, lateribus rotundatis, angulis posticis fere nullis, foveis basalibus sparsim grosse punctatis; elytris striatis, interstitiis paulo convexis, apice leviter sinuatis.

♂. *Tarsis quatuor anticis, articulis* 2—3 *latissime dilatatis,* 2^{do} *fere semicirculari,* 3^{io} *brevi.* *Long.* 2¼—2½, ♂ ♀.

Distinguished from the other species of the genus by its greater convexity and the sharper and deeper striation of the elytra. The colour of the upper surface is shining black, with a faint brassy metallic sheen on the elytra. The extreme lateral margins of the thorax and the elytra are rufescent; the two basal joints of the antennæ, the palpi and the basal half of the tibiæ are also of the same colour. The basal foveæ of the thorax are coarsely but sparsely punctured.

West Coast, S. Island, numerous examples (C. M. Wakefield).

HYPHARPAX ABSTRUSUS.

H. antarctico *proxime affinis, dimidio major. Oblongus, æneo-niger, antennarum articulo* 1^{mo}, *tibiisque (apicibus exceptis) rufotestaceis: thorace transversim quadrato, postice paulo magis quam antice angustato, lateribus antice late rotundatis, angulis posticis paulo obtusis apice rotundatis, foveis basalibus sparsim grosse punctatis: elytris apice oblique fortiter sinuatis, apud suturam productis, suprà undulatis, sericeo-nitentibus (præcipiue* ♀), *striatis, interstitio tertio apicem versùs puncto majori conspicuo.* *Long.* 3 *lin.*, ♂ ♀.

Agrees with *H. antarcticus* in almost everything except size; Castelnau giving 2½ lines as the length of that species, which agrees with a very large number of specimens that I have examined. "The feeble punctiform impression behind" of Castelnau's phrase also indicates a difference between *antarcticus* and the present species, in which the interstitial puncture is very large and conspicuous. When the two species are compared, several other points of difference are observable, which it is impossible to render clear by description.

Described from a single pair (♂ ♀) from Auckland.

A specimen in Mr. Wakefield's collection, ticketed "Tairua, Capt. Broun," and others which I have examined from "Wellington," and from parts of New Zealand not specified, differ from the type described in the sutural apex of the elytra not being notably prolonged, and in the thorax being much less rounded on the sides anteriorly and more gradually narrowed to the base. Some of the specimens have a slight greenish tinge, and others have two basal joints of the antennæ clearish red. It is impossible, without much further material, to decide whether we have here to deal with several closely allied species, or only with a single variable one.

BEMBIDIUM ORBIFERUM.

Oblongo-ovatum, convexum, nigro-æneum, palpis, antennarum articulis basalibus pedibusque fulvo-testaceis: capite ovato, oculis modice convexis, sulcis frontalibus latis: thorace fere globoso, late rotundato, juxta basin constricto, ibique lateribus parallelis, angulis rectis: elytris apice angustatis, striato-punctatis, interstitiis vix convexis, tertio punctis duobis parvis; striis exterioribus apice vix impressis. Long. 2½—3 *lin.* ♂ ♀.

♂. *Tarsi antici, articulis duobus dilatatis apice intus productis, primo oblongo, secundo parvo.*

Allied to *B. rotundicolle*, *callipeplum*, &c. Thorax much more strongly rounded, more constricted at the base, with hind angles more distinctly rectangular. It is also larger than the allied species, more convex and broader, the thorax being also larger in proportion to the whole insect. The colour of the upper surface is dark brassy, more or less cyaneous. The thoracic foveæ, as in the rest of this small group, are feebly marked; long, narrow, and situated close to the hind margin near the angle. The elytra taper strongly just before the apex, and are there more or less testaceous. The striæ are but feebly impressed, but the punctures are strong. The third interstice has only two small punctures. The first dilated joint of the male tarsi is much longer than in the allied species.

West Coast of Southern Island (C. M. Wakefield). I have also a specimen from Mr. H. Edwards, ticketed "Auckland."

BEMBIDIUM CHALCEIPES.

B. anchonodero *affine, at paullo latius, modice convexum, cuprascenti-æneum: thorace fortiter rotundato, juxta basin fortiter angustato; elytris punctato-striatis, striis paullulum impressis, interstitiis planis; antennis articulo primo piceo; pedibus æneis. Long.* 2¼ *lin.*

Closely allied to B. anchonoderum (Bates), having the same general proportions, *i. e.*, the thorax is not so short relatively to the elytra as in *B. parviceps* and *Tairuense*, and not so broadly-rounded, and relatively large, as in *B. eustictum* and *orbiferum*. The insect is also broader and flatter. In nearly all the specimens, the colour is dullish coppery-brown, with the head more greenish-brassy, and the antennæ and legs metallic, except the basal joint of the antennæ, and sometimes the tibiæ, which are more or less reddish-pitchy. The thorax is slightly shagreened, and, as usual in this group, rather abruptly narrowed just before the base, where the sides, for a short distance, are straight and parallel. The striæ of the elytra are very slightly impressed, but the punctures are very distinct, and are not wholly obliterated near the apex.

Typical examples of *B. anchonoderum* are only 1¾ lin. long.

West Coast, Southern Island (C. M. Wakefield).

BEMBIDIUM HOKITIKENSE.

B. anchonodero *proxime affine; differt colore nigro, thorace paulo latiori, striisque* 3—7 *apice evanescentibus. Supra paulo convexum, nigrum, leviter æneo-tinctum; palpis, antennis, pedibusque nigris: thorace latiori, valde rotundato, juxta basin constricto ibique lateribus rectis, supra vix ruguloso; elytris punctato-striatis, striis* 3—7 *ante apicem desinentibus, interstitiis paulo convexis. Long.* 1½ *lin.*

Another of the numerous ill-defined species closely allied to *B. anchonoderum*. The colour of the two specimens taken by Mr. Wakefield is dull brassy-black, quite different from the brighter brassy tinge of *anchonoderum*. But the chief distinction lies in the broader form of the thorax, which is a conspicuous differentiating character, when the two species are compared side by side; another good character is offered by the smooth apical area of the elytra.

West Coast, South Island (C. M. Wakefield).

PTEROSTICHUS (TRICHOSTERNUS) AUCKLANDICUS.

Elongato-oblongus, thorace quàm elytris distincte angustiori; capite magno, antice (cum mandibulis) elongato: viridi-æneus, nitidus, elytris fusco-æneis; palpis antennisque rufo-piceis, pedibus piceis: thoracis margine antico arcuato-emarginato, mox pone angulos anticos leviter rotundato-dilatato, deinde gradatim, ante angulos posticos citius, sinuatim angustato, angulis rectis; fovea utrinque curvata valde profunda: elytris elongato-ovatis, postice latioribus, suprà profunde æqualiter striatis, striis fundo punctulatis, interstitiis passim convexis, tertio 3 *vel* 4-, *septimo pluri-punctatis. Long.* 9—11 *lin.*, ♂ ♀.

Variat colore saturate cupreo, ut in Tr. Australasiæ, Guér.

Distinguishable from *Tr. Sylvius* and allies at once by its quite different form, due to relative narrowness of the thorax, which is also longer, less rounded anteriorly, and more gradually narrowed to the base, its basal foveæ are also deeper and more curved or branched.

The head is much larger, especially much longer in front of the eyes; the mandibles and palpi being also longer. The elytra offer fewer points of difference; the interstices, however, maintain their convexity to the apex. The antennæ and palpi are reddish, and the legs dark pitchy-red in all the examples I have seen.

One example, from Auckland, differs from the above description, in being of a dull purplish-copper hue, inclining to æneous on the head and thorax.

PTEROSTICHUS (TRICHOSTERNUS) TEMUKENSIS.

Niger, supra fusco-cupreus, lateribus interdum viridibus; palpis apice rufis: thorace transversim quadrato, postice vix sinuatim angustato, angulis posticis paulo prominentibus; elytris elongato-oblongis, punctato-striatis, interstitiis convexis, 3^{io}, 5to, *et* 7mo *paulo latioribus.* *Long.* 9½ *lin.*

Very closely allied to *Tr. Sylvius*, and probably only a local form of the same. Comparing half-a-dozen specimens of each species, *Tr. temukensis*, besides its more uniform and dusky-cupreous colour, appears rather more elongate and parallel-sided, and shows, in some examples, a conspicuous inequality in the width of the elytral interstices. But the most important and constant structural feature is in the curvature of the sides of the thorax; this, instead of forming a rather deep sinuation posteriorly between the middle and the tip of the hind angles, continues nearly to the base, as in *Tr. antarcticus*, the angle being somewhat abruptly, and, to a less degree than in *Tr. Sylvius*, turned outwards. The head and front margin of the thorax are formed the same in both species.

Temuka (C. M. Wakefield).

PTEROSTICHUS (TRICHOSTERNUS) SYLVIUS.

Suprà viridi-æneus vel cupreo-æneus, marginibus viridibus, nitidus, palpis apice rufis: thorace transversim quadrato, postice sinuatim angustato, angulis posticis prominentibus, acutis: elytris oblongis, punctato-striatis, interstitiis convexis, æqualibus, tertio 3 *vel* 4-, *septimo pluri-punctato.* *Long.* 9 *lin.*

Agrees with the description of *Feronia* (*Tr.*) *rectangula* (Chaud.) in every important respect, except in the hind angles of the thorax, which, instead of being "exacte rectis," are decidedly projecting. This character is constant in the six examples before me, and is corroborated by the shining metallic colour of the whole upper surface, head included; Chaudoir giving as a speciality of *Tr. rectangula*, "color paginæ superioris minus nitidus, elytrorum dorso fere nigricante." Specimens agreeing with this description were taken by Mr. Wakefield, at Rangiroa, whereas all his examples of *Tr. Sylvius* came from Peel Forest.

Tr. Sylvius has the head of moderate size in both sexes, with prominent eyes, and very small, rapidly narrowed, posterior orbits. The thorax is arcuate-emarginate on the fore margin, with rounded anterior angles, quite as broad at the base as at the apex, and moderately dilate-rotundate at a short distance behind the anterior angles. The elytra are dentate at the humeral angles, the punctures in the striæ are small and distinct, and the interstices become flatter towards the apex.

Peel Forest, S. Island (C. M. Wakefield).

PTEROSTICHUS (HOLCASPIS) INTEGRATUS.

Elongatus, niger, suprà cuprescens; thorace quadrato, mox ante basin fortiter angustato, angulis acutis: elytris oblongo-ovatis, elongatis, striis vix punctulatis, omnino integris, septima apicem versus fortius impressa. *Long.* 9 *lin.*, ♂ ♀.

Very closely allied to *Pt. vagepunctatus* (White); differing chiefly in the striæ not being interrupted, and in the 7th stria being deepened into a flexuous sulcus, extending from two-thirds its length to the apex. The elytra are rather more narrowed to the base, and consequently more oval than in *Pt. vagepunctatus*, and the hind femora of the ♂ are not dilated on their under surface.

Hokitika and Lake Paroa (C. M. Wakefield).

PTEROSTICHUS (RHYTISTERNUS) PUELLA, Chaud., Bull. Mosc., 1865, No. 3, p. 44.

Captain Broun has recently sent examples of this Australian species from Tairua, both to Mr. Wakefield and Dr. Sharp, which bear the closest resemblance to specimens, with which I have compared them, from Queensland.

ANCHOMENUS (PLATYNUS) OTAGOENSIS.

Elongatus, deplanatus, nigro-piceus, opacus; antennis, palpis, pedibusque omnino melleo-fulvis: labro late emarginato; collo haud sulcato: thorace elongato-quadrato, postice longe, sinuatim sed modice angustato, angulis posticis subacutis; suprà impunctato, utrinque linea curvata paulo impressa a basi fere ad marginem anticum ducta: elytris planis, elongato-ovatis, prope apicem fortiter sinuatis, apice suturali obtuso, subtruncatis; suprà subtiliter striatis, interstitiis planis.
Long. 5 *lin.*, ♂ ♀.

Allied to *A. deplanatus* (White), from which it is at once distinguished by the tawny-yellow colour of antennæ, palpi, and legs. From other allied species it is distinguishable by the form of the *thorax, which is not at* all strongly narrowed behind, but gradually *and slightly, the anterior* part of the sides being also gently rounded:

the shallow lateral groove begins as a broad depression, with the basal fovea, and extends towards the front, gradually becoming narrower and fainter. The elytra are nearly plane, smooth, and opaque, regularly elongate-oval, with sharp lateral edges: the interstices are quite flat, and the three punctures of the 3rd very well marked. The labrum is broadly and distinctly emarginated. The mesosternal epimera are short and broad as in the sub-genus *Platynus*.

Otago.

(To be continued).

NOTES REGARDING SOME RARE *PAPILIONES.*

BY D. GREIG RUTHERFORD, F.L.S.

2. PAPILIO HOMERUS, Fabr.

Originally described by Fabricius (Ent. Syst., iii, 1, 1793) from a drawing made by Jones, taken, according to Donovan (Nat. Rep., i) from a specimen in the possession of Drury; and in 1801 more fully described, and, for the first time, figured, by Esper in his "Ausländische Schmetterlinge," this splendid *Papilio* has, until within the last few years, been rarely met with in European collections. In England it has, I believe, been confined to those of the British Museum, the Hope Museum at Oxford, and that of the late Mr. W. C. Hewitson. This is the more remarkable, since its habitat (Jamaica) has long been well known—has been frequently visited by naturalists, and in all directions traversed by English travellers who, we may readily conclude, would spare no pains to secure such a gorgeous and conspicuous insect, if it came in their way.

P. Homerus has already been so well and so fully described by Godart in the "Encyclopédie Méthodique," and by Boisduval in the first volume of his "Species Générales," that it is unnecessary for me to do more than supplement their work. This I am fortunately enabled to do from a comparison of a number of fine specimens recently received by my friend Mr. F. J. Horniman from Jamaica, the only region in which, so far as I can learn, this species has hitherto been found. My comparison results in the following addition to the descriptions referred to:

Upper surface of both pairs of wings varying from dark brown to deep black: transverse bands varying from a bright lemon colour to rich yellow. Apical spots usually five, sometimes all but the upper *two suppressed. Lunules* on hind wings generally five, various shades *of yellow, orange,* or bright red, often very faint, and in some examples altogether absent; usually distinct and well marked in female. Inner margin of hind-wings of female at extremity of transverse band finely dusted with orange. Expanse, 5—6½ inches.

As illustrative of the habits and nature of the habitat of this species, I extract from a letter recently received from our correspondent in Jamaica, the following interesting account of the capture of the specimens now in the Surrey House Collection:

"I lost no time in trying to obtain news of the classical object of which I was in quest; but, though there was a doctor who had been resident in the neighbourhood for fifteen years, and a clergyman who had also been stationed there for some time, neither had seen it, or could give me any information as to its haunts. One Negro boy of whom I enquired, informed me that it was found near a certain river. For this I accordingly started early one morning; but though I searched in all directions and the likeliest places, I could find no trace of *Homerus.* At last, and just as I was beginning to despair of finding it, I caught sight of a fluttering mass of unusual proportions about twenty yards ahead of me, and presently recognised the object of my search. The difficulty now was to catch it, for it was hovering round a mango tree on the bank of the river. I advanced cautiously, and, on my approach, it sheered off a little, but soon returned to a position within reach of my net, when, with one fortunate stroke, I secured my prize. I leave you to imagine my feelings when I found the glorious creature fluttering inside my net. For three successive days I wandered for miles up the same stream, seeing a specimen occasionally, but getting no chance of making a capture, and I reluctantly decided to try another part of the island. Before doing so, however, I made one more visit to the stream, along which I walked to a place where a waterfall came down the face of a very high rock, with a narrow gorge between. Here I rested, thinking what a paradise it *ought* to be for butterflies. Gigantic trees quite overshadowed the river, and the undergrowth was rank and luxuriant. Presently, to my great delight, I saw, just above my head, a mass of blue and gold sailing gracefully along: then another; and, after going a little way, one wheeled round and came up the bank low down, just hovering over the leaves for a second, but before he could fly further I had him safe in my net; and ere I left that place, I had succeeded in capturing several fine specimens.

"Regarding the habits of this species, I observed that few specimens *were on the wing* before *noon*. They then all come down the *river (chiefly on the* same side), hover over leaves of trees, principally the mango, rarely or never settle, and about 3 p.m. begin to come up the stream, when they gradually disappear. Every one I secured was captured on the wing. I never saw them alight on flowers; but, on two occasions, I saw one settle on the top of a mango tree. Its mode of flight is very deceptive, appearing to be slow, but, in reality, is very rapid. It is fearless, if one remains perfectly quiet, but the slightest movement will cause it to swerve in its flight. I tried very hard to discover the caterpillar, and offered rewards to the natives for it, but my efforts were fruitless."

The extraordinary fact of such a large and strongly winged butterfly capable, one would think, of long and sustained flight from one region to another, being confined to such a small area as that comprised by Jamaica, is highly significant, in view of some of the problems raised by the subject of the geographical distribution of species. The large majority of *Lepidoptera*, we know, are dependant for their range of distribution upon that of the plants upon which their caterpillars feed; and while, in the case of a widely distributed species, we argue either a corresponding extension of its food plant, or a capability of adapting itself to more than one kind of plant, we naturally infer, when we find another species confined to a small area, that it is so restricted because its food plant does not extend beyond the same region. It is a well known fact, that many of the older forms of plant life, unable to adapt themselves to recent climatic changes, have gradually narrowed their range of distribution, and already show signs of becoming extinct. If we suppose the case of a plant at one time distributed over a large area, and furnishing food for a given species of butterfly, gradually yielding to adverse influences until it becomes confined to one locality in which alone it found the conditions favourable to its existence, the butterfly, unless it had been able to find food elsewhere, would suffer a corresponding restriction and diminution in numbers until it at last quite died out. This would be pre-eminently the case with such species as originated during a period when the physical conditions of a given region were different from what they are at present. I am inclined to regard *P. Homerus* as an illustration of this general law, and feel convinced that when its food plant is known, it will prove to be not only one of the rarest but also one of the oldest forms of the flora of the West Indies. In the extract given above, the mango is mentioned as one of the plants to which *P. Homerus* shows a preference, and it may occur to some that this may be the food plant of the species. This, however, is hardly probable, as the mango has been introduced into Jamaica only within very recent times. Like many other species of *Lepidoptera*, *P. Homerus* is, doubtless, attracted to the mango by the sweet juices exuded from its fruit soon after its becoming ripe.

Nearly allied to but one species, viz., *P. Andræmon*, found as yet only in Hayti, Cuba, and some parts of Mexico, *P. Homerus*, although exhibiting most of the characteristics peculiar to similar forms common to Central America and the West Indies, is yet so distinct from them all, that it seems to occupy a position quite unique in the group to which it is referred. Reasoning from the analogies presented by other insular species and varieties of *Lepidoptera*, I am strongly of opinion that *P. Homerus* is a survival of some group of *Papiliones* once largely distributed throughout Central America at a time when the region now occupied by the Gulf of Mexico and the Caribbean Sea formed part of the Mainland.

Surrey House, Forest Hill: *June*, 1878.

LIST OF THE *HEMIPTERA* OF NEW ZEALAND.

BY F. BUCHANAN WHITE, M.D., F.L.S.

(*Continued from Vol.* xiv, *p.* 277).

Tribe LYGÆODEA.

Of this tribe or section Captain Hutton mentions five and Mr. Butler four New Zealand species. Of these five, I have seen New Zealand specimens of two only, but I am able to add nine other species, one of them, however, being possibly identical with one of Walker's species.

Family BERYTIDÆ.

14. *Neides Wakefieldi*, *n. sp.*

Pale testaceous, coarsely punctate above and below; the sides of the head and of the prostethium with a longitudinal brown line; the last joint of the antennæ and the apex of the tibiæ and of the tarsi ferruginous-brown. The apical lamina of the head cylindrical, straight, gradually narrowed to an obtuse point, and reaching far beyond the apex of the head; the anteocular part of the head sub-equal to the postocular; the antennæ two-thirds the length of the body; pronotum rather flat, with sub-parallel sides and a longitudinal keel, the length less than double the breadth behind; elytra much abbreviated, and only one-fifth the length of the abdomen, immaculate; legs and antennæ (especially the front femora and basal joint of antennæ) with small black tubercles in rows.

Length, 7—8 mm.; breadth, scarcely 1 mm.

Wellington (Wakefield); several specimens.

It is very probable that this is an apterous form of a dimorphic species—*dimorphism being* not unfrequent in this family, though the *species are rarely so* brachypterous as in this instance.

Family LYGÆIDÆ.

15. *Lygæus* (*Spilostethus*) *pacificus*, Boisd. This I have not seen. It occurs also in Tasmania and Australia.

16. *Arocatus ruficollis* (= *Lygæus ruficollis*, Walker).

Though the description of *Lygæus ruficollis*, Wlk. (which Mr. Butler *l. c.* says is "not a *Lygæus*"), does not altogether tally with my specimens, I have little doubt but that they belong to that species. The type specimen is evidently (from the description) a dark example, for usually the red markings are much more extensive, the clavus and interior and apical margins of the corium, as well as the apex of the scutellum and base of the pronotum, being generally of that colour. It is allied to *A. rusticus*, Stål, an Australian species.

Common. Messrs. Broun, Hutton, and Wakefield.

17. *Nysius zealandicus*, Dallas.

The teeth on the hind margin of the pronotum are often nearly or quite obsolete.

Common. Messrs. Broun, Hutton, and Wakefield.

18. *N. Huttoni*, *n. sp.*

Obovate, greyish-testaceous, with grey pubescence and coarse fuscous punctures; head rather finely punctate, black, the vertex and the antennæ reddish-brown, the outside of the 1st joint of the antennæ, the 2nd and 3rd towards the apex, and the 4th darker; pronotum with a transverse band near the front margin, a central longitudinal band abbreviated before and behind, the sides, and some spots within the hind angles, irregularly black, as is almost all the scutellum except the extreme apex. Elytra streaked more or less with black, the extreme front margin and three spots more or less confluent on the apical margin, always fuscous-black; membrane whitish, spotted with fuscous at the base; legs yellow-testaceous, spotted (especially the femora) and punctured with black; the 1st and 2nd joints of the tarsi at the base, and the whole of the 3rd, fuscous-black; body below black marked with yellow. Head sub-equal in length to the pronotum, and with the eyes somewhat broader than the apex of the latter; the bucculæ not reaching the base of the head, scarcely decreasing in height backwards and suddenly ending, about equal to the 1st joint of the rostrum; rostrum reaching the hind coxæ; 1st joint of the antennæ much, and the 2nd a little, longer than the 3rd. Scutellum with a triradiate elevation in the middle. Elytra sub-parallel at the base, then dilated and reflexed along the front margin. ♂ ♀. Length, 3½—4 mm.; breadth, 1¾ mm.

In the structure of the bucculæ, *N. Huttoni* is allied to *N. marginalis*, Dall. It is also allied to *N. thymi*, Wolff, and *N. cænosulus*, Stål; but it is broader than the first, and differs from the second by the shape of the bucculæ, pronotum, &c. It varies somewhat in the intensity of the dark markings.

Messrs. Hutton and Wakefield.

19. *N. anceps, n. sp.*

Oblong, brownish-testaceous variegated with black, with grey pubescence and coarse punctures. A yellowish band runs through the basal half of the head to the apex of the scutellum; the centre of the clypeus and a larger spot on each side reddish-brown; the upper margins of the orbit yellowish. Antennæ pitchy-brown, the inside of the 1st joint (except at the apex), a broad band in the middle of the 2nd, and the apex of the 3rd, pale reddish-brown. Veins of the elytra pitchy-brown. Legs yellow-testaceous, a broad band on the upper side of the femora, rows of spots on the femora and tibiæ, the base of the 1st and 2nd joints of the tarsi, and the whole of the 3rd joint, pitchy-black. Upper surface of the abdomen with a broad central band, and on the three basal segments a narrower and interrupted band on each side black; under side of the body blackish-fuscous, with paler bands and spots. Head and pronotum sub-equal in length, the head with the eyes a little broader than the apex of the pronotum; 2nd joint of the antennæ longer than the 3rd, which is sub-equal to the 4th. Bucculæ as long as the gula, gradually disappearing behind and not reaching the base of the head; 1st joint of the rostrum a little shorter than the bucculæ, the apex of the last joint reaching the middle coxæ. Sides of the pronotum sub-parallel, diverging a little behind, the front angles with a small sharp tooth. Elytra abbreviated, scarcely covering the base of the abdomen, the front margin somewhat rounded, the membrane rudimentary.

Length, 5—5½ mm., breadth, 2 mm.

N. anceps is perhaps the type of a new genus, but, in the meantime, I have kept it in *Nysius*. Possibly it may have a macropterous form.

Two specimens taken by Mr. Wakefield.

Family PACHYMERIDÆ.

20. *Plociomerus Douglasi*, Buch. White.
Captain Broun.

21. *Pamera nigriceps*, Dallas. "New Zealand," Mayr (Novara Hemiptera).

This species so very much resembles the last, that I have, with some hesitation, suggested (Ann. N. H., May, 1878) that *possibly* the two may have been confounded, a not very improbable occurrence, if Dr. Mayr had only the original description of *P. nigriceps* (made when it alone of the two was known) to guide him. I have seen no New Zealand specimens of this species, which is common at Honolulu and elsewhere.

Rhyparochromus inornatus, Walker (B. M. Cat., v. 112. 196), seems, from the description, to be either this species or No. 20. It is referred *to "the group Scolopostethus*," but it is certainly not the *species described* hereafter (No. 26).

METAGERRA, *n. g.*

Body oblong. Head triangular, equilateral, immersed to the eyes, and with them rather broader than the apex of the pronotum. Rostrum reaching the middle coxæ, and the 1st joint attaining the base of the head. Antennæ about half as long as the body, the 1st joint reaching beyond the apex of the head. Pronotum rather broader than long, slightly convex, and with a slight transverse depression before the hind margin ; front margin one-third shorter than the hind margin, both concave ; side margins keeled and sub-reflexed, nearly straight, but rounded in front. Scutellum longer than broad. Elytra with abbreviated membrane (always ?). Legs mediocre ; femora (especially the front pair) thickened ; front femora with one small spine and some obscure tubercles near the apex below ; tibiæ straight ; basal joint of the hind tarsi as long as the last two joints together. Hind margin of 3rd ventral segment curved forward at each side, and not reaching the margin of the body.

Allied to *Rhyparochromus* and *Stygnocoris*.

22. *M. obscura, n. sp.*

Dull chestnut-brown, the two basal joints of the antennæ, rostrum and legs (especially the tibiæ and tarsi), paler ; pronotum with a spot in the middle of the front margin, the reflexed side margins, the hind angles, and some spots on the hind lobe, the scutellum with a spot on each side behind the disc, whitish-brown ; rostrum at the tip, pronotum with an obscure fascia within front margin, an obscure central line, and a spot on each side of the centre of the hind lobe, scutellum with a central band from the middle to the apex, corium with a streak in the middle of the apical margin, as well as the tarsi-claws, blackish ; clavus and corium obscurely variegated with paler and darker, and with dark punctures ; membrane fuscous, with pale streaks. Antennæ with the 1st joint thickened upwards, the 2nd more slender but also thickened upwards, the 3rd and 4th stoutish and fusiform ; pronotum with the hind lobe very short and remotely punctured, hind angles truncate, hind margin concave in front of the scutellum ; scutellum punctured ; elytra with rows of punctures, the clavus with three rows ; membrane very short, leaving nearly one-quarter of the abdomen uncovered. ♂ ♀. Length, 3⅓ mm. ; breadth, 1½ mm.

Two specimens taken by Mr. Wakefield. Doubtless a macropterous form occurs.

(*To be continued.*)

Orthotyli with green cell-nerves.—Being about to describe the *Cyllecoraria* of Europe, I beg the British Entomologists to collect during this summer especially specimens of the many *Orthotyli* which occur in their country. These species are not yet sufficiently elucidated, and it is necessary to compare many individuals of both sexes before we can surely characterize them. I shall be very much obliged to the Hemipterists who will have the kindness to communicate to me specimens of the above named species, with information relative to the trees on which they live.—*O. M. Reuter, Helsingfors : June 7th,* 1878.

DESCRIPTION OF A NEW SPECIES OF *CORDULEGASTER* FROM COSTA RICA.

BY R. McLACHLAN, F.R.S., &c.

The fine new Dragon-Fly described below was taken by Mr. H. Rogers on the volcano known as Mt. Irazu (at an elevation of between 6000 and 7000 feet), and was sent home by him to Messrs. Salvin and Godman. I examined three ♂ and one ♀.

CORDULEGASTER GODMANI, *n. sp.*

Occiput brown, with a crest of blackish hairs: back of the head (behind the eyes) yellow. Front brown (black about the ocelli), above ciliated with black; the excavated superior portion darker, almost blackish. Nasus yellow, slightly brownish in the middle. Rhinarium dark brown or fuscous. Labrum yellow, slightly brownish on the sides. Labium and palpi yellow.

Body black. Thorax clothed with yellowish-grey hairs; above with two cuneiform yellow stripes, broadest posteriorly; sides with two narrow oblique yellow bands, the lower the broader, the intermediate band indicated by two widely separated yellow spots (most conspicuous in the ♀). Legs black; femora piceous externally (excepting at the tips). Abdomen brownish at the base; second segment with a complete yellow ring, very narrow on the middle above, joining and including the oreillettes in the ♂, becoming gradually broader and very oblique on the sides in the ♀, the posterior margin of this segment above with two yellow transverse spots widely separated, and the margins of the genital suture are broadly yellow; 3rd to 7th segments with a narrow median yellow ring, interrupted on the middle above, on the 3rd to 5th there are also two widely separated posterior yellow spots; 8th with a broad complete yellow median ring, expanding on the sides posteriorly; 10th with a narrower complete basal yellow ring.

Appendages of the ♂ black: the superior scarcely so long as the 10th segment, somewhat dolabriform, the apical edge very oblique; beneath they are furnished with two teeth, one basal, triangular and rather large, the other ante-median, smaller, and slightly hook-shaped: inferior appendages nearly quadrate, slightly narrower in front, the apex excised. In the ♀ the vulvar horns are piceous, and extended somewhat beyond the apex of the abdomen.

Wings hyaline, strongly tinged with brownish in the very adult ♂, and then slightly yellowish at the extreme base (more conspicuously so in the ♀); costal edge finely yellowish outwardly; pterostigma narrow (4 mm. long), black; membranule pale cinereous, 19—21 ante-cubital, and 14—16 post-cubital nervules in the anterior-wings.

Length of abdomen, ♂, 55 mm.; ♀, 58 mm. Length of posterior-wing, ♂, 45 mm.; ♀, 50 mm.

In the very adult ♂ (and also in the ♀) the yellow markings of the abdomen are apparently sometimes nearly obliterated.

Among American species this should come nearest to *C. maculatus* and *C. diadema*, but is abundantly distinct from either in the character of the markings.

Lewisham: June, 1878.

Change of generic names.—In vol. xiii, p. 23, of this Magazine, I described a new Coleopterous insect from New Zealand and called it *Camirus convexus.* I find the word *Camira* has already been used for a genus of *Coleoptera,* and I therefore propose to alter the word *Camirus* into *Camiarus,* so as to differentiate it sufficiently from the pre-existing *Camira.*

Epistrophus (mihi, Ann. Nat. Hist., xviii, p. 22) must also be changed, on account of *Epistrophus,* Kirsch. (Berl. Ent. Zeit., 1868), and I propose to call the Colydiid insect *Epistranus Lawsoni.*—D. SHARP, Thornhill, Dumfries: *June 14th,* 1878.

Strange locality for Anobium paniceum.—Lord Arthur Russell has brought to my notice a curious instance of that adaptability in this insect, which accounts so easily for its abundance and wide distribution. Ten years ago, he bought a parcel of powdered Orris root at the well known Convent of Sta. Maria Novella at Florence, where the nuns sell various articles for toilet purposes. This parcel was accidentally unopened until now, and was found to have afforded a pasturage and breeding-ground for many generations of the beetle, which swarmed in it. My first introduction to it in any quantity was in a Medical Lecture Room in the Strand, where it had established a colony in a human skeleton, which had been dried with the ligaments left on.—E. C. RYE, 70, Charlewood Road, Putney, S.W.: *June 15th,* 1878.

Observations respecting Phalæna Stratonice of Cramer.—In the 21st part of the "Tijdschrift voor Entomologie," recently published, there is a paper by P. C. T. Snellen upon *P. Stratonice* of Cramer. The author states that in February of last year he obtained a pair of Japanese moths from Mr. Heine, which reminded him greatly of *Vithora indrasana,* of Moore, as represented in the figure (P. Z. S., 1865, pl. 42, f. 5), and also (excepting in the structure of the body) of Cramer's *Phalæna Stratonice.*

Knowing how frequently broken specimens of insects are mended up with the bodies, antennæ, &c., of other species, he was "inclined to suspect a similar deception "in this instance, but before concluding this to be the case, he induced Mr. C. "Ritsema, the ever-obliging Curator of the insect-room in the National Museum at "Leiden, to see if specimens of *P. Stratonice* existed in the Museum, and to let him "know what kind of antennæ they had." The following was Mr. Ritsema's reply: "The Museum possesses two examples of *Ph. Stratonice,* Cramer, both possessing only "the left antenna, whilst in one also the abdomen is wanting. The other example "seems to me, or, rather, I am certain of it, to be a female.* The antennæ of both "at first sight seem to be like one another: slender at the base, slowly growing "thicker towards the end, and, as it seems to me, provided near the end of the "joints with some fine little hairs.† Cramer seems, to judge by the strongly combed "antennæ, to have figured a male." Mr. Snellen then examined his moths, and finding that one of his specimens was a male, he concluded that the antennæ of Cramer's original were false.

After recording the above possible fact, Mr. Snellen goes on to criticize the view held by recent Lepidopterists of the affinities of *Vithora* (which he now considers congeneric with *Ph. Stratonice*), and states his opinion that it is nearly allied to

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* *Evidently from the width of the* abdomen.

† *Just the same as in Vithora indrasana,* Moore.

Abraxas, *Pantherodes*, and *Rhyparia*, concluding with a few remarks upon the modern views of protective resemblances, in which he mentions the fact that I named the common Japanese moth *Vithora agrionides*, in the "Annals and Magazine" for 1875, and he says: "moreover, he informs us that it 'mimics *Phalæna* "*Stratonice*, Cramer!' without clearly informing us whether he grounds this con- "clusion on objects like what Cramer represents, or only upon the figure."

In my description of *Vithora agrionides*, I do not anywhere say that it mimics *P. Stratonice*, but that it "resembles *Cystidia Stratonice*, Cramer, excepting in the "body;" and I add, in a foot-note, "*Cystidia* is probably a mimic of *Vithora*:" this I still believe to be the case; for, although I have examined many examples of *Vithora agrionides*, and have not hitherto seen Cramer's insect, it is well-known that in most instances of mimicry, the *pattern* is by far more numerous in individuals than the *copy*, so that there is every probability that the species will yet come.

If there were no other differences but those which Cramer figures and describes in the body of his species, I should still hold that *Vithora* belonged to a distinct family; but the pattern of the wings, though very similar, differs as much as in any of the numerous parallel species of the genera *Heliconius* and *Melinæa* amongst the butterflies.

I cannot for a moment agree with Mr. Snellen as to the affinities of *Vithora*, the antennæ alone would at once decide their position to be in the family *Agaristidæ*; nor is there any reason (excepting that in colour, it nearly agrees with one or two species of *Abraxas*,* which are mimickers of it) for referring it to the *Zerenidæ*: the whole structure of the body is essentially that of *Agarista*, and the veining of the wings is quite normal.—A. G. BUTLER, British Museum: *May*, 1878.

Description of the larva of Eubolia bipunctaria.—On August 6th, 1875, I received eggs of this species from Mr. A. E. Hudd, of Clifton, Bristol. They were globular, very glossy, with a semi-translucent appearance; pale straw-colour. Before hatching, which event took place on the 20th of the same month, they changed to lead-colour, but still retained their glossy character. The newly emerged larvæ were slate-colour, the head brown. They fed on the common white Dutch clover until autumn, when they hibernated, feeding again in the following spring. By June the 8th, they were nearly full-grown, when I took the following description:—Length, about an inch, and stout in proportion; head rather narrower than the second segment, rounded at the sides, but the face somewhat flat; there is a slight notch on the crown. Body roughly cylindrical, and of nearly uniform width throughout, tapering only a very little towards the anal extremity; segmental divisions well marked, and each segment is also divided by transverse ribs into numerous sections; trapezoidal tubercles raised, each emitting a short hair.

Ground colour of the dorsal area pale yellowish-grey with slight green tinge; head very pale yellowish-brown, dotted and freckled with darker brown. Dorsal stripe conspicuous, dark green, on each side of it is another much narrower, and consequently less distinct line, of the same colour; there is also a rather indistinct double line above the spiracles: spiracles rust-colour, each followed anteriorly by an intensely black dot; tubercles also black. The ground of the ventral surface is much

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* *Can Mr. Snellen have got the Abraxas* instead of the *Vithora*? Compare Felder's figure (*Reise der Nov. Lep., pl. cxxix, fig. 29*); this species occurs also in Japan, and is not uncommon. —*A. G. B.*

darker than the dorsal area, being a pinkish-brown shade; extending throughout its entire length is a broad stripe of still darker brown, and within this stripe is a double central yellow line. On segments 6, 7, 8, 9, 10 and 12 is a double series of large black marks placed within the broad central stripe, but outside, and on each side the double yellow inner line: pro-legs brown on the outside, this colour being very noticeable on the anal claspers.

The pupa is about five-eighths of an inch long, smooth, the thorax and abdominal segments polished, the wing-cases duller. It is uniform and cylindrical, but sharply attenuated towards the anal point. Colour almost uniformly bright brown, the anal point, segmental divisions, and eye-cases darker. The first imago emerged July 26th.—Geo. T. Porritt, Highroyd House, Huddersfield: *June 4th*, 1878.

Description of the larva of Crambus contaminellus.—Towards the end of May, 1877, while turning over a stone on muddy earth near a sea-bank, I chanced to find a small larva, which I brought home together with part of a little rigid tuft of grass that was growing close to the stone. The larva was evidently a *Crambus* of a species I had not before seen, and seemed near moulting; a few days later, having accomplished its moult within a slight web it had spun around itself and attached to the grass, it began to feed well on the grass, and to fashion its dwelling with more silk into a complete tubular form, and to cover it with frass.

After watching its progress a little, it was not very difficult to find a few more, the only real difficulty seemed to consist in finding stones in similar places not already tenanted by ants or other predaceous creatures. However, on the 11th of June following, I fell in with an occasional stone or two that rested on or close to small tufts of *Poa maritima* and *Borreri*, which were, so to say, tenanted by one of these larvæ, and in one instance by two of them. When these stones were turned over the tubular gallery, though of no great length, was readily seen attached to the lower whitish sheaths of the grass towards the roots, being conspicuous, however small, by its covering of fine greenish frass, or frass and fine grains of earth together, or else partly spun against the stone itself, the sudden removal of which tore open the gallery and the surprised larva dropped out.

These larvæ throve very well in confinement on growing tufts of the same species of grass planted in a pot, with some of the muddy soil, and surrounded with a few small stones, amongst which they constructed their galleries, and when full-fed converted them into very tough cocoons smoothly lined with brownish-grey silk, and externally coated with fine earth and frass.

The moths, and a couple of ichneumons, were bred from July 17th to August 7th.

This season I have again found a few of the larvæ, and have been able to verify and extend last year's observations, so that I can now say in early spring the larva is not more than three-sixteenths of an inch long, the body of an earthy reddish-brown with darker brown head, the spots and plates of the same colour as the body but contrasting by their gloss alone. After each moult the colour becomes greyer as they advance in growth, and when full grown the larva measures a little more than three-fourths of an inch in length, and is moderately slender, yet the segments have a certain characteristic plumpness in detail from their being well defined, and each sub-divided with a deep transverse wrinkle between the trapezoidal spots of the back; the rather rounded head is a trifle less than the second segment, which is long in proportion, and the body tapers a little just towards the hinder part: in colour the head is greyish-brown marked with blackish-brown, the plate behind it is similar, and both shining; the body lightish dull earthy-grey with a rather darker dorsal line, the spots lightish brown and glossy, the larger trapezoidal pairs transversely roundish-ovate, the smaller pairs rather linear and each encompassed with a faintly paler outline; a row of somewhat tri-lobed spots along the side, and under them the small round black spiracles, and beneath them again other rows of paler and longitudinally ovate spots; every spot having within it, nearer the outer margin than the middle, a small black dot bearing a fine hair: on the front part of the thirteenth segment the two spots are united into one larger than usual, a few minute dark dots are on the shining anal plate; the ventral and anal legs tipped with brown hooks.

Varieties occur with dark brown heads, and plates on the second segment; but principally towards the last (when about to pupate) these parts and the anal plate grow darker, and the rest of the body lighter of a dirty yellowish tint.

The cocoon, constructed as before described, is of a somewhat oval figure, its longer diameter about five-eighths of an inch, and shorter diameter one-fourth. The pupa is a little over three-eighths of an inch in length, and one-eighth in diameter at the thickest part, its form is quite ordinary though the wing-covers are rather long in proportion, and from them the abdomen tapers to a bluntish rounded-off tip; it is of a warm brown colour, and glossy, with the abdominal tip blackish-brown.—William Buckler, Emsworth: *June 5th*, 1878.

Capture of Argyrolepia (or Eupœcilia) Mussehliana near Pembroke.—On the 27th ultimo, when I was examining a patch of *Genista tinctoria*, for larvæ feeding in the shoots, a small *Eupœcilia* started up and was secured. It belonged evidently to the group which includes *Geyeriana* and *udana*, but I could not then identify it. The ground was almost covered with *Inula dysenterica*, so *notulana* might reasonably be expected, but this insect was too yellow and too glossy. By long and hard work in the afternoon I secured three more, and on examining them at home was astonished and delighted to find that I had re-discovered the long-lost *Mussehliana* (see *ante*, vol. xi, p. 133).

I know of no record of its occurrence in this country since Weaver took his few specimens in Devonshire many years ago. Some of these were placed in Mr. Doubleday's collection, and I expect Mr. Allis had, and partially distributed, the rest.

It does not now intend, I fear, to become a common species, for I have seized every available opportunity of looking for it since, with but very limited success.—Chas. G. Barrett, Pembroke: *June 10th*, 1878.

On the distinctive characters of Penthina postremana, Z.—In the June No. (p. 14) Mr. Hodgkinson very briefly recorded his discovery of the larva of *Penthina postremana*, Zell., in the stems of wild balsam and the rearing of the perfect insects; but I think a few further particulars may be of interest, especially as the species, from its secluded locality in Cumberland, cannot well be of recent introduction, but is most likely an ancient inhabitant, perhaps far more widely distributed in this country in the (good) old times of undrained marshes and fens and extensive morasses than it now is. It is one of the most beautiful species in the genus, and a short description may be useful.

Al. exp. 7½ lines. Head pale yellow; antennæ and eyes black; thorax black, marbled with yellow; abdomen grey; fore-wings long, rather *pointed at the apex*, and of pretty uniform width, ground colour pale yellow almost obliterated by grey and bluish scales; basal blotch angulated, shining blue-black; central fascia black, strongly angulated outwards and faintly interrupted, beyond this fascia an elongated black triangular spot on the dorsal margin of the wing extends beyond the middle, and at its apex joins an oblique black blotch which reaches the hind margin: at the apex of the wing is a round black spot edged with blue lines. The spaces between these markings are filled in with a marbling of glossy blue, grey, and orange, except before the apex, where the usual black and silvery streaks are visible in the pale ground colour, and at the anal angle, where is a *conspicuous somewhat square yellowish-white spot*, including that part of the cilia. The remainder of the cilia blue-black *with two yellow spots or dashes in the middle*. Hind-wings dark grey, darkest at the margin, cilia pale grey.

The larva, with its habit of feeding and hibernating in the stems of *Impatiens noli-me-tangere*, is described by Von Heyden (Stett. Ent. Zeit., 1865, p. 378), and it appears that Mühlig has recorded the rearing of the allied *Penthina fuligana* from the same plant, but it does not seem impossible that Herr Mühlig may have made some mistake as to the species reared by him, both because *fuligana* is well known to feed in the roots of various species of *Stachys*, and because from this circumstance it appears to have been confounded with *nigricostana*, Haw., which has similar habits.

When I wrote some notes on these species (*vide* vol. ix, p. 129) I did not feel satisfied about some German specimens sent by Professor Zeller under the name of *Remyana*. He afterwards sent me a type of *fuligana*, Hüb., by which I was able to satisfy myself that it (and two of the supposed *Remyana*) were really identical with specimens taken in Surrey, although the dark markings were much less intense in colour. These Surrey specimens were *carbonana*, Dbld., = *ustulana*, Haw., and their coincidence confirmed Wocke's correction of the name to *fuligana*, Hüb. This species is the smallest of our *Penthinæ*, but is sufficiently like *postremana* to make it desirable that the points of distinction should be pointed out. The male is but 6 lines in expanse, but large females sometimes reach 8 lines. In the males the fore-wings are rounded, but in the females, although the apex is rounded, it and the anal angle are slightly dilated, so that the hinder part of the wing is broad and peculiar in shape. The markings are very obscure, consisting of a black strongly angulated basal blotch, a narrow irregular central fascia, from which is a curved projection outwards below the middle, a triangle at the anal angle and several streaks across the apex, all black. Ground colour apparently whitish, almost totally suffused with bluish-grey, or steely, scales. Cilia *entirely dark grey*. This description applies well to both Continental and South English specimens, but some specimens reared by Lord Walsingham from roots of *Stachys palustris*, from Wicken Fen, present singular variations. These variations are in the greater or less partial absence of the suffusion of bluish-grey scales, some specimens showing the white ground colour pretty plainly, while one shows the close alliance of the species with the normal *Penthinæ* by having the apical third of the wing almost entirely white. But in all these the markings, when visible, agree closely with typical *fuligana*, and in all the cilia are *entirely dark grey*.

The two species may therefore be easily separated:—*postremana* having the apex *of the fore-wings pointed* and the dark cilia with one blotch and two spots pale yellow; while *fuligana* has rounded fore-wings and dark grey cilia. But the most *conspicuous* character is the square pale yellow blotch at the anal angle in *postremana*.—ID.: *June* 10*th*, 1878.

Acherontia Atropos in the County Cork.—I have to record the appearance and capture of a specimen of *A. Atropos* at the same place (viz., Schull) as before chronicled (*vide* vol. xiv, p. 158, *ante*). This specimen was captured at 9.30 on the evening of June 8th last, and is now in my possession.—WILLIAM W. FLEMYNG, The Vicarage, Glengariff, Co Cork: *June* 17*th*, 1878.

The Scandinavian Psyllidæ.—In the 8th fasciculus of his "Opuscula Entomologica" (1877), Professor C. G. Thomson gives, *more suo*, a Synopsis of the Scandinavian *Psyllidæ* under the title of "Öfversigt af Skandinaviens Chermesarter," reverting to the name *Chermes*, under which Linné, in 1742, characterized this Section of the *Homoptera*, and to which Geoffroy, in 1762, applied the name *Psylla*, rejecting Linné's name as erroneously used, because *Chermes*, in ancient time, designated the insect which afforded the famous Tyrian dye (*Coccus ilicis*, Lin.); and there is no doubt that, on the ground of priority, Thomson is right in his restoration, though, on the other hand, most authors have followed Geoffroy. Thomson's object in this article is, he says, partly to recapitulate Zetterstedt's species, and partly to divide the Section into small natural groups by means of characters never before utilized for this purpose, namely, the form of the head, pronotum, elytra, and posterior coxæ. As to genera, he adopts—*Trioza* (with *Trichopsylla* as a new sub-genus for *T. Walkeri*); *Chermes vice Psylla* (with, as sub-genus, *Atænia vice Arytæna* for *C. genistæ*, and *Psylla* for the other species); *Aphalara*, *Rhinocola* and *Livia*. To Zetterstedt is given the credit of having first pointed out the essential character of the neuration of the elytra as of the greatest importance both in distinguishing species and in grouping them.

In *Trioza* 11 species are enumerated:—*Walkeri*, Foerst.; *galii*, Foerst.; *obliqua*, n. sp. (near *albiventris*); *dryobia*, Flor; *acutipennis*, Zett., = *femoralis*, Flor; *striola*, Flor; *nigricornis*, Foerst.; *urticæ*, Lin.; *viridula*, Zett.; *proxima*, Flor; and *hypoleuca*, n. sp. (near *obliqua*).

In *Chermes* are 24 species:—*genistæ*, Latr., = *spartii*, Hartig; *fraxini*, Lin.; *fraxinicola*, Foerst.; *sorbi*, Lin.; *fuscula*, Zett., = *alpina*, Foerst., = *perspicillata*, Flor; *buxi*, Lin.; *alni*, Lin., = *Heydeni*, Foerst., = *fuscinervis*, Foerst.; *Foersteri*, Flor, = *viridis*, Hartig, = *alni*, Foerst.; *betulæ*, Lin.; *Zetterstedti*, n. sp. (very like *salicicola* in colour, rather smaller than *betulæ*); *lutea*, Thoms., = *saliceti*, Flor (*nec* Foerst.); *quercus*, Lin., = *costato-punctata*, Foerst., = *annulicornis*, Boh.; *puncticosta*, n. sp. (very like *quercus*, but much larger and more obscure in colour); *pyri*, De Geer (hitherto attributed to Linné); *mali*, Foerst. (Löw cites Schmidberger as the older authority for this name); *annellata*, n. sp. (like *mali*, but differing in the neuration and the genitalia); *nigrita*, Zett., = *pulchra*, Zett.; *elegantula*, Zett.; *obliqua*, n. sp. (like the preceding, but differing in the neuration and the genitalia); *Hartigi*, Flor, = *sylvicola*, Reut. (Reuter cites Lethierry); *microptera*, n. sp. (like *obliqua* in form, and *salicicola* in the genitalia); *pruni*, Scop.; *saliceti*, Foerst.; and *salicicola*, Foerst.

In *Aphalara* 6 species:—*exilis*, Ljungh (otherwise attributed to Weber and Mohr); *affinis*, Zett.; *calthæ*, Lin., = *picta*, Zett.; *nervosa*, Foerst.; *artemisiæ*, Foerst.; *graminis*, Lin., = *nebulosa*, Zett., = *radiata*, Scott.

In *Rhinocola* 2 species:—*aceris*, Lin.; *ericæ*, Curt., = *callunæ*, Boh.

In *Livia* 1 species:—*juncorum*, Zett. (more properly Latr.).

Chermes sorbi, *quercus*, *calthæ*, and *graminis*, of Linné, have puzzled every one for more than a century, and yet they are here referred to as a matter of course. When a species can be undoubtedly referred to the description of an old author his name ought certainly to be adopted, but it is not stated on what evidence the conclusions have been arrived at with regard to these species so long hidden from recognition.

Chermes sorbi, Lin.: Thomson's description fairly agrees with Linné's.

„ *quercus*, Lin., has "4 brown spots on the anterior margin and one on the interior margin of the elytra":—Thomson's is "orange spotted with white; elytra hyaline with pale nerves,"—and not a word about brown spots.

„ *calthæ*, Lin.: Thomson says, = *picta*, Zett., but Reuter gives *polygoni*, Foerst., as the only synonym, and enumerates *picta*, Zett., as a distinct species.

„ *graminis*, Lin., has "pedes non saltatorii," which would at least make it doubtful if it were one of the *Psyllidæ* at all, but this is not noticed by Thomson, who gives it as = *nebulosa*, Zett., = *radiata*, Scott; which last species, at any rate, does not accord with Thomson's words "elytris fere ut in *A. exili* nebulosis."

One cannot but admire the wonderful succinctness of Thomson's diagnoses, but it is doubtful if they are sufficient to differentiate new species, especially if the particular species, with which comparison is made, is not before the student; and no dimensions are given. Neither are the plants on which the insects are found, nor the times of their appearance mentioned, both being possibly due to the fact, stated by the author, that he has rarely collected any of the species himself; but they are serious deficiencies for all who would desire to capture them. The authors who have described species of *Psyllidæ* since the times of Foerster and Flor are only twice, and then incidentally, referred to; it is, therefore, not at all improbable that some of the species deemed to be new have been already described by them.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *April* 30*th*, 1878.

Notes on Cynipidæ and Aphides.—I found, on the 5th of April last, a very common Cynipid, the *Neuroterus lenticularis*, laying its eggs in the bud of a young oak in my garden. I could adjust a glass tube over the insect without disturbing it in its operation, and saw how it repeated five times the act of inserting its terebra in the bud. The following day it was dead, and I had it put in my collection. I destroyed all buds of the branch except the attacked one, and surrounded the branch with a bag of muslin; the leaves soon displayed themselves, and three of them showed after about a fortnight the well known galls of another Cynipid, the *Spathogaster baccarum*, viz., three on one leaf and one on each of the others. On the 5th of May, the winged "*Spathogaster*" made its appearance. This fact is a new confirmation of Dr. Adler's discovery on the dimorphism of *Cynipidæ*.*

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* *Vide* p. 12, *ante*.—EDS.

I had also good fortune in my breedings of *Aphidæ*, the solitary egg I had obtained from the apterous female of *Pemphigus spirothecæ* in January last, at Nice, gave me on the 20th of April, the young louse forming the first phase of the new colony. I have followed the formation of the gall.

The eggs, which I had found under the bark of the elm and which I suspected to be those of *Tetraneura ulmi*, gave me also their produce as a little louse, which proved to be the very insect I expected. I saw it form its galls, and I could follow the first and second phases, as they are now taking wing. . . . But now here is the difficulty, where do they go in summer?

I find now at the roots of grass (*Bromus*) a little louse which I suppose is Kirby's *Aphis radicum* or Koch's *Amycla fuscicornis*, but the winged form (unknown to the authors) is very curious, as it carries its wings, like *Phylloxera*, horizontally and crossed on the back. The neuration of the wings is that of *Aploneura*, Passerini, of which one species only (*A. lentisci*) is mentioned by the author. The new one ought to receive the name of *A. radicum*, and the forms known to me are the third and fourth phases, this last as winged Pseudogyne, carrying the sexuated pupæ, and the sexuated ♂ and ♀ *without rostrum*. It is a curious fact that in the other *Haploneura* only the gall-maker (the fundator) and the second phase (the emigrant) are known and described (this last winged), but producing young ones *with rostrum and not sexuated*.—J. Lichtenstein, La Lironde, near Montpellier: *June*, 1878.

Stridulation in Insects and the Microphone—a suggestion.—As the microscope reveals to the eye of man all the most insignificant of Nature's works, why may not the microphone disclose to our hearing the most inaudible sound? Through Professor Hughes' discovery we may hope to have great light thrown upon the somewhat obscure subject of "Stridulation in Insects." As soon as the microphone is practically developed, what can possibly hinder us from adding it to our long and able list of entomological apparatus. We shall then be able to hear our *Thecla rubi* at work in the wood-borders, and possibly a female *Saturnia carpini* may be distinctly (nay loudly) heard to call her loving mate from a distant spot, and this in a language of her own.—S. D. Bairstow, Woodland Mount, Huddersfield: *May 29th*, 1878.

Luminous Insects, especially Diptera.—This subject having been alluded to in the notice on "Luminous Lepidopterous larvæ" (*vide* vol. xiv, p. 260, *ante*), I may be allowed to complete the references there given.

In the "Entomol. Monatsblätter," by Dr. Kraatz (1876, p. 41), there is a very interesting observation on luminous *Chironomi*, by Brischke. They were observed on a warm summer evening in 1860: the light seemed to proceed from the thorax and abdomen. Dr. Loew determined the species as *Chir. tendens*. In the same article, the previous observations on the same phenomenon, by Pallas (his *Culex* was a *Chironomus*), and by Alenitzin, Member of the Aralo-Caspian Expedition, are referred to; an account of the latter, given in the "Deutsche Entom. Zeitschr. (1875, p. 432), is quoted.

Another case of phosphorescence among *Diptera* deserves to be investigated. *The head of the* rare and remarkable fly *Thyreophora* cynophila is said to be luminous. This fly is metallic blue, its head comparatively large, swollen, and of a bright orange-red. Macquart ("Suites à Buffon," ii, p. 497) says about it: "Quant "aus habitudes, elles sont fort lugubres. Il ne recherche que les tenèbres et les "cadavres desséchés. A la sombre lumière de sa tête phosphorique, il se jette sur les "ossements décharnés et se repaît des derniers restes de l'animalité. C'est sur les "chiens morts qu'il se trouve." Macquart's authority is probably Robineau Desvoidy, who says ("Essai sur les Myodaires," 1830): "On l'a trouvée deux ou trois fois dans "les environs de Paris, sur diverses sortes de cadavres. M. le Comte de Saint Fargeau "en possède un individu pris dans une écurie de cavalerie, et que la tête, phospho-"rescente durant la nuit, rendait facile à reconnaître." Beyond this single statement, the fact has never been recorded, as far as I know, and I thought it worth while to draw upon it the attention of entomologists who may be in a position to verify it.

Concerning luminous Coleopterous larvæ, see my articles in "Proc. Entom. Soc. Philad." (1862, p. 123, tab. i, f. 8, and *l. c.* vol. iv, 1865, p. 8); also a brief notice in the "Canadian Entomologist" (December, 1868). In these articles I described a beautiful luminous larva, three inches long, which occurs in North America, and which I refer to *Melanactes (Elateridæ)*.

Finally, I will notice on the same subject of luminosity of insects, that the "American Entomologist (and Botanist)" (vol. ii, p. 371, St. Louis, 1870), contains an article, "Luminous (?) leaf-hopper," the author of which pretends to have noticed that the Homopteron *Tettigonia quadrivittata*, Say, emits flashes of scintillations in the dark. The Editors of the Review, in publishing this article, very properly express their doubts about the reality of this observation. This communication was undoubtedly a hoax.—C. R. OSTEN-SACKEN, Heidelberg: *June*, 1878.

Obituary.

William Chapman Hewitson, F.L.S., was born at or near Newcastle-on-Tyne on January 9th, 1806, and died at his residence, Oatlands, Weybridge, on May 28th, 1878.

After completing his education he was articled to a Surveyor, and subsequently practised his profession at York and at Bristol; but at a later period the bequests of relatives placed him in an affluent position and free to cultivate his tastes for Natural History on an extensive scale.

Whilst yet a comparatively poor man, he commenced a work on British Oology, of which the first part was published at Newcastle and London in April, 1831. His earliest published entomological observations appear to have been the localities of *Lepidoptera* occurring near Newcastle, York, &c., in Stephens' "Illustrations," commencing (in 1828) at *Polyommatus Agestis* and *Artaxerxes* and extending to near the end of the *Pyralidæ*. In vol. v of the "Entomological Magazine," in 1837, is a note by him "on the Economy of *Hedychrum*," one of the *Chrysididæ*. In 1844 he visited Switzerland, and an account of his doings amongst the Alpine Butterflies will be found in the "Zoologist" for 1845; henceforth his attention appears to have been more especially devoted to exotic Butterflies. It is needless here to refer to the numerous papers published by him in Journals and in the Transactions of various Societies (the latest having appeared in this Magazine in March of the present year). *His best known works are the* illustrations for the "Genera of Diurnal Lepidoptera," *published (with descriptive* matter by E. Doubleday and Westwood) from 1846 to

1852, the "Exotic Butterflies," commenced in 1851 and concluded (at the termination of the third volume) in the present year, and his separate work on the *Lycænidæ*, left unfinished at the time of his death, and which will (we believe) be edited and concluded by his faithful friend and co-worker, Professor Westwood. These works are remarkable for the surpassing accuracy and fidelity exhibited in the forms and colours of the wings, drawn by himself on the stone and coloured from his own patterns. In these points he was (and probably will long remain) without an equal. On the other hand, the absence of appreciation of structural characters other than those furnished by the wings is painfully apparent, the bodies and legs being delineated in a mechanical manner (or the latter altogether omitted); nor do we any where find notes of biological interest in his writings on Butterflies.

These omissions, and the want of power of grasping (or intelligently combating) the modern philosophical theories of Natural Science, will prevent his name acquiring the high position amongst those of scientific Entomologists in which we should have liked to have seen it. This is greatly to be deplored. After fortune had favoured him, he spared neither time nor money in amassing materials: there never has been an Entomologist to whom science is so directly indebted in this way; there probably never has been one who could have advanced its higher branches more directly had he aimed at something further than the mere possession and description of specimens of the perfect insects.

Some thirty years ago the Oatlands Park Estate (once the residence of the Duke and Duchess of York) was cut up into a variety of lots for building purposes. Mr. Hewitson purchased the first of these (about ten acres) and built himself a house, laying out the grounds with exquisite taste and planting a variety of choice conifers and flowering shrubs, so that to the natural beauties of the suddenly-broken ground, with ornamental water at the foot of the slope, and two large and aged cedar trees near the mansion, as the trees and shrubs grew up, ever more and more charms were added. Hence a visit to Oatlands was remembered by the many who enjoyed the privilege as one of the experiences of a life-time. It is possible that few more genuinely single-minded and charitable men have (or ever will be) connected with Entomology. Truly we could better have spared a better man, from an entomological point of view.

Mr. Hewitson had long been a valetudinarian, but up to the last his most intimate friends refused to believe his end was so near. So far as we can learn, the disposition of his collections and property is strikingly in keeping with his character. The Butterflies are bequeathed to the British Museum on the condition that they remain separate for twenty-one years, accompanied by a wish that at the expiration of that time the same condition be extended for a further similar term; the birds' eggs are left to his friend and publisher, Mr. Van Voorst, who long ago assisted him (when assistance was valuable) in continuing his "British Oology." He was a widower for many years before his decease, leaving no issue, and no relatives; his property—after the payment of large sums to several charities, liberal bequests to his executors, and a multitude of smaller amounts to his servants, and to those who had directly, or indirectly, assisted him in his entomological pursuits—is left to an old friend and schoolfellow; with the exception of his library, bequeathed to his native town (Newcastle), and certain pictures which will enrich the national collection.

Entomological Society of London: *5th June*, 1878.—H. W. Bates, Esq., F.L.S., &c., President, in the Chair.

Mr. J. A. Finzi exhibited an example of *Anthocharis cardamines* from Darenth Wood, remarkable inasmuch as although it appeared to be undoubtedly a ♀, one fore-wing had a large patch of orange on the underside only.

Mr. D. G. Rutherford exhibited a series of large, brown, irregular masses of strong web from 4 to 7 inches in diameter, being the common envelopes of aggregations of cocoons of a species of *Bombycidæ* allied to *Anaphe Panda*, Bdv., sent from Mount Camaroons (5000′ alt.) by Mr. G. Thomson. Each of these masses contained from 130 to 150 special cocoons, and to some of them were attached cases containing large larvæ (still living) of a parasite, either Dipterous or Hymenopterous, probably the latter.

He also exhibited an example of *Papilio Boisduvalianus*, which on one of its anterior-wings showed some of the markings usual in *P. Cynorta*, and which he thought confirmed, to some extent, the suspicions that these supposed two species are only sexes of one.

Mr. Meldola exhibited a series of objects forwarded by Mr. Darwin, viz.:—photographs of two species of *Orthoptera* allied to *Pterochroza illustrata* and *P. ocellata*, received from Dr. Zacharias, and remarkable for their perfect imitation of dead leaves, which was carried out in the neuration of the wings even to microscopic details as compared with the ribs and veining of leaves; small beetles of the genus *Spermophagus* bred from seeds of *Cassia neglecta* sent from Brazil by Dr. Fritz Müller, and received alive in this country; and the proboscis of a *Sphinx* caught by the tubular nectary of a pale yellow *Hedychium*, also from Dr. F. Müller. He mentioned that Dr. Müller (Blumenau, Santa Catharina, Brazil) was anxious to enter into correspondence with entomologists respecting the scent-producing organs of *Lepidoptera* not occurring in Brazil.

Sir S. S. Saunders, on behalf of M. Lichtenstein, communicated a series of notes by the latter on the Natural History of *Aphides*, especially *Phylloxera*, in reply to Professor Westwood's criticisms on his theories in his last Presidential Address.

Mr. Park Harrison brought under the notice of the Society certain marks on chalk found during his examinations of the old shafts at Cissbury. Some of these he attributed to direct human agency two thousand years ago, but of others he was not so sure, and thought they might have been caused by insects. These exhibitions occasioned considerable amusement and discussion, the result of which was that Mr. Park Harrison was informed that he might be perfectly certain the markings were not due to insects. There appeared also to be a pretty general idea that all the markings were of *very* recent origin.

Dr. Fritz Müller communicated "Notes on Brazilian Entomology," especially concerning the odours emitted by butterflies and moths, and their bearing on the theory of evolution. Considerable discussion ensued, in which the President, Mr. Meldola, Mr. Wood-Mason, Mr. Distant, Mr. McLachlan, and others, took part.

Dr. Sharp communicated a paper on some Longicorn *Coleoptera* from the Hawaiian Islands.

Mr. P. Cameron communicated a paper on the larvæ of *Tenthredinidæ* with special reference to protective resemblance.

The President read a paper on *Macropsebium* Cotterilli, and other new species of *Coleoptera*, from Lake Nyassa.

NEW *COLEOPTERA* FROM NEW ZEALAND.

BY D. SHARP, M.B.

Among some *Coleoptera* that I have recently received from New Zealand, there are a few interesting species which I think may be named and characterized with advantage: as they are either species closely allied to known ones so as to be readily identified, or else forms so entirely new that they cannot be mistaken for anything else. They are :—*Demetrida mœsta* (*Carabidæ*); *Brachypeplus brevicornis*, *Epuræa zealandica*, and *Soronia optata* (*Nitidulidæ*) ; *Brounia thoracica*, an isolated form, that cannot, I consider, be placed with advantage in any of the families of *Coleoptera; Pericoptus stupidus* (*Dynastidæ*) ; *Cilibe Huttoni* and *Chærodes concolor* (*Tenebrionidæ*) ; *Rhipistena lugubris* (*Evaniocerides*, but connecting them with *Mordellistena*) ; *Somatidia longipes* (*Cerambycidæ*), and *Cryptodacne synthetica* (*Erotylidæ*) ; *Brounia, Rhipistena* and *Cryptodacne* are new generic names.

We are indebted to Professor Hutton, of Dunedin, and Captain Thos. Broun, of Whangarei, for the discovery of most of these insects.

DEMETRIDA MŒSTA, *n. sp.*

Depressiuscula, sat nitida, nigra, pedibus fere concoloribus, antennis rufescentibus, articulis 1° et 3° infuscatis; prothorace sat lato, obsoletius transversim strigoso; elytris subtiliter (fere obsolete) striatis, apice oblique, vix sinuatim, truncatis. *Long.* 6½ *mm., lat.* 2⅞ *mm.*

This seems very distinct from the other described species; it is rather broad, and in its form resembles *D. picea*, but the thorax is even more quadrate than in that species; the elytra have no impressions, and their apex is not so straight as in *D. picea*, the species being in this respect intermediate between *D. picea* and *D. nasuta*.

A single individual has been sent from Otago, by Professor Hutton.

BRACHYPEPLUS BREVICORNIS, *n. sp.*

Depressus, sub-oblongus, parallelus, niger, antennis pedibus elytrorumque parte basali rufis, his apice late fuscis, subtus griseo-pubescens, supra nigro-pubescens, sed pubescentia ad basin elytrorum et abdominis grisea.
Long. 3½—3¾ *mm., lat.* 1⅓ *mm.*

The antennæ are short and rather stout, red in colour, the joints are short, the 2nd and 3rd being each only a little longer than broad, while the following are not so long as broad. The head and thorax are densely and finely punctured; the latter is strongly transverse, nearly straight at the sides, but distinctly narrowed in front, the hind angles rectangular and very definite; the colour at the sides is more dilute. The elytra have the basal part rufescent, the apical blackish, the limit between the two colours is indefinite; their sculpture is fine and indistinct, and consist of series of fine punctures, and punctate interstices. The dense pubescence of the upper surface is blackish, but there is a patch of pale pubescence at the base of the elytra, and two very large patches on the first exposed dorsal segment, there are also a few pale hairs on the margin of the following segment, at the hind angle.

The male has a supplementary dorsal segment.

The species may be located in Murray's sub-gen. *Tasmus*, near the Australian *B. binotatus* and *B. blandus*; though it greatly resembles these species, it is very readily distinguished by the much shorter antennæ.

Sent from Tairua by Captain Broun, as No. 303.

EPURÆA ZEALANDICA, *n. sp.*

Latiuscula, testaceo-ferruginea, supra prothoracis disco elytrisque plus minusve infuscatis; crebrius evidenter punctata; prothoracis elytrorumque lateribus sat explanatis, his apice in utroque sexu rotundato.
Long. 3 *mm., lat.* 1⅝ *mm.*

This species is intermediate in form between *E. deleta* and *E. limbata*, Er., and is about the size of the latter. The club of the antennæ is elongate. The labrum is elongate, but is deeply divided nearly to its base. The thorax is shaped much as in *E. deleta*, but the sides are more explanate, and the base on each side is more sinuate, the surface is uneven on account of some obsolete impressions.

Sent from Tairua by Captain Broun, as No. 239.

OBS.—This species is evidently variable in colour, it has not only the appearance of our European species of *Epuræa*, but I can detect no structural character whatever to distinguish it. The male is distinguished from the female by the broad front tarsi, and the additional minute apical segment. White's *Nitidula antarctica* is, I have no doubt, another species of *Epuræa*; I have specimens agreeing with his insufficient description; the species has the peculiarity that in the female the apices of the elytra are prolonged and acuminate.

SORONIA OPTATA, *n. sp.*

Oblonga, nigro-fusca, antennis, pedibus, prothoracis elytrorumque limbo rufescentibus, supra tomento obscuro, setisque deorsum curvatis vestita; elytris pone medium fascia undulata colore dilutiore. Long. vix 4 *mm., lat.* 1⅞ *mm.*

This insect is rather long and narrow in form. The eyes are rather small, but very prominent; the thorax is much emarginate in front, nearly straight, and not undulate at the sides, the hind angles obliquely truncate; its surface is a little uneven, and its sculpture is quite concealed by the obscure tomentum and setæ which it bears. The elytra are clothed in a similar manner, so that their sculpture is also obscure.

The species cannot be confounded with *Soronia hystrix*, on account of its very different outline; it has also the setæ of the upper surface very different, for, instead of being upright and very conspicuous as in that species, they are arched or bent down, so as to escape notice when only a superficial observation is made.

I have seen but one individual; it was from Mr. Bakewell's collection, where it was merely labelled New Zealand.

BROUNIA THORACICA, *n. sp.*

Oblongo-ovalis, nigra, elytris purpureo-nigris, sat dense pubescens, minus nitida, tarsis fusco-testaceis; thorace lateribus et parte anteriore deflexis et dense punctatis, disco inæquali minus punctato, margine basali crenato; elytris crebre sat fortiter punctatis, versus suturam obsolete sulcatis.

Long. 5½ *mm., lat.* 2 *mm.*

Antennæ rather long, the 1st and 2nd joints short and bead-like, 3rd larger and triangular, 4th shorter than 3rd, somewhat produced inwardly, 6th to 11th each produced inwardly into a long slender lobe, 5th joint intermediate in form between the 4th and 6th. Thorax with all the anterior and lateral parts depressed, so that their outer margins are not visible from above, these parts densely and coarsely punctured, the part which remains in the natural plane of the pronotum shining and but little punctured. Scutellum conspicuous, somewhat circular, impunctate; elytra rather long, black, but with a distinct violet or purple tinge, shining, but pubescent, with some ill-defined longitudinal grooves towards the suture, and rather closely, but not coarsely, punctured. Under-surface densely punctured, and very densely and finely pubescent, except on the middle of the metasternum.

Captain Broun has sent me an individual of this species labelled *Drilus ? atrocæruleus;* and informs me he has only been able to find two specimens. It is one of the most remarkable beetles yet discovered in New Zealand, and I give below its structural characters, so far as I can make them out from the very brittle and mutilated example before me. I have, with very great pleasure, named the insect in honour of its discoverer, whose energy and skill are doing so much to enable us to get a satisfactory knowledge of the important insect-fauna of New Zealand.

Anterior parts of the head atrophied, so that the antennæ appear inserted near one another on its front edge, eyes large and conspicuous; antennæ 11-jointed, the basal joints small, those towards the extremity emitting an elongate lobe: beneath, the parts of the mouth seem small but exposed, and the apical joints of the labial and maxillary palpi rather large and subsecuriform. The prothorax is so formed that its anterior open part is placed on the under surface, and the head can be completely doubled in and concealed, all the parts of the head except the prominent trophi when doubled in fit the front opening, and to accomodate the trophi, there is a deep depression in the middle of the prosternum, which extends as far as the coxæ.

The flanks or side-pieces of the thorax are rather largely developed, and their limits and sutures quite distinct; the prosternum is divided as above described, by a very deep fossa or depression in the middle, the piece on each side of this depressed middle part is rather large: the front coxæ are moderately distant from one another, being separated by a depressed prosternal process, the form of the coxæ themselves I cannot see, but their inner terminations are distinctly exserted. The mesosternum is exposed between the middle coxæ, and is emarginate in front, so as to receive the prosternal process and (probably) render the prothorax almost immoveable. The middle coxal cavities are moderately large, irregularly oval, with the slender part outwards, and the embedded coxæ have a small trochantin visible. The metathorax is moderately long, its episterna are large, and almost parallel-sided; the epimera are minute and triangular, and can be seen at the extremities of the coxa and episternum. The hind coxæ are nearly contiguous in the middle, and have a very short but broad upper lamina, which is, however, distinctly broader at its inner portion over the trochanteral articulation; there is a perpendicular lamina to which the femur and tibia can be closely applied when flexed, so as to be concealed. There are five rather large ventral segments, the basal one of which sends off a narrow process between the coxal laminæ. The tarsi are all five-jointed, the 1st and 2nd joints are rather small, the 3rd is very small, but bears a large membranous lobe, extending forwards on the under-face of the foot, the 4th joint is very small, and might, without a careful examination, be supposed to be absent; the 5th joint is, without the claws, as long as the other four together, the claws are large and simple.

This extraordinary insect is one of the most interesting of the *Coleoptera*; it is undoubtedly allied to *Chelonarium*, though at first sight it has more the aspect of an Eucnemid; it departs very widely from *Chelonarium* by the structure of the antennæ, which are similar to those of *Cerophytum elateroides*, except that the basal joint is much smaller. I see no other relationship except to *Chelonarium* and *Cerophytum*, and, in my opinion, it goes far to settle the position of the latter most remarkable insect, for *Cerophytum* is just intermediate between *Brounia* and the *Elateridæ* and *Eucnemidæ*. To force any of these interesting insects into the ordinary families of *Coleoptera*, is to refuse to recognise them for what they really are—isolated anomalies, whose relationships, even *inter se*, are highly problematical.

PERICOPTUS STUPIDUS, *n. sp.*

Supra nigro-piceus, nitidus, subtus cum pedibus piceo-rufus, et (abdomine excepto) fulvo-hirsutus; prothorace transverso, elytris angustiore, impunctato; elytris obsolete punctatis, et vix perspicue sulcatis; pygidio utrinque parce punctato. *Long.* 18—22 *mm.*, *lat.* 11—12½ *mm.*, *alt.* 8½—9½ *mm.*

Mas, prothorace in medio pone marginem anteriorem obsolete tuberculato, et in medio indeterminate depresso.

Fem., prothoracis tuberculo et depressione ægre distinguendibus.

Head rough over all the upper surface, on the middle indefinitely transversely elevated, the clypeus much narrowed to the front, and the front edge, in the middle, a little reflexed, and obscurely emarginate: the form of this part does not differ in the sexes.

Several very mutilated individuals of this species were sent from Otago by Prof. Hutton; I should fancy they were picked up dead.

OBS.—There are two very distinct forms placed in collections as *Pericoptus*, and though at first sight they appear very similar, I think they will probably ultimately form distinct genera. In the larger insect, which is generally called in collections *P. truncatus*, the anterior part of the head is flattened, and placed on a different plane to the hinder part, so that the front part forms a sort of disc, which is evidently the same in kind (though less in development) as that of *Temnorhynchus*. In the species I have here described as *P. stupidus*, the head departs but little from the *Pentodon* form. So far as I can judge from White's description of *Cheiroplatys punctatus*, I consider it will prove allied to *P. stupidus*.

CILIBE HUTTONI, *n. sp.*

Picea, antennis pedibusque rufis vel piceo-rufis; prothorace nitido, crebrius minus fortiter (disco parcius et subtiliter) punctato, lateribus rotundatis, basin versus angustatis, ad angulos posteriores acutos haud explanatis; elytris subopacis, crebrius irregulariter punctatis, longitudinaliter subsulcatis.

Long. 10—12 *mm., lat.* 5—6 *mm.*

The antennæ are short, and are reddish in colour, with the 3rd and one or two following joints generally more obscure, the 9th and 10th joints are decidedly shorter than broad; the thorax is strongly transverse, with the sides rounded and the base a little sinuate on each side, so that the hind angles are decidedly acute.

The male at first sight seems to exactly resemble the female, but a careful examination shews some constant, though inconspicuous, characters to distinguish it; the front tibiæ along their inner and hinder edge bear a dense very short pubescence; the intermediate tibiæ are clothed in a similar but more conspicuous manner, and are not at all incurved at their extremity.

The species can only be confounded with the variable *C. elongata*, but it is undoubtedly distinct. Mr. F. Bates, to whom we are indebted for the most of our knowledge of the species of this difficult genus, agrees with me on this point, and as he has been kind enough to point out the characters by which it differs *primo visu*, I quote here his remarks in a letter to me. He says: "on first looking at the Cilibe, I "judged it to be *elongata* (the form *phosphugoides*, White); on com-

"parison, however, with a numerous series of that species, I find it to "be distinct. Your species has the prothorax relatively broader, distinctly more rounded at the sides, and contracted at the base, the "punctuation at the sides more open, the elytra not opaque, and with "but very few of the small, shining, black granules which stud the "surface in *elongata*; the two costiform elevations down the middle of "each elytron are in your species obsolete."

This species is probably to be found in numbers in the province of Otago; a series of good specimens sent by Prof. Hutton from there shew but little variation.

I may here remark that I am in hopes that the very difficult species of this genus may be elucidated by examination of the characters distinctive of the sexes; I feel pretty sure that more than one true species is at present called "*elongata*," although the examples before me do not enable me to settle the point.

(To be concluded in our next).

INTRODUCTORY PAPERS ON FOSSIL ENTOMOLOGY.

BY H. GOSS, F.L.S., F.G.S.

No. 2.

[*The comparative age of the existing Orders of Insects, and the sequence in which they appeared on the Geological Horizon.*]

Primary or Palæozoic Period.

Up to the present time no traces of insects have been met with in the most ancient fossiliferous rocks. The oldest organic remains,[*] belonging to one of the lowest[†] classes of the animal kingdom, were discovered by Sir Wm. Logan, in 1859, in the Laurentian rocks of Canada.

The Cambrian rocks contain remains of *Hydrozoa*, *Echinodermata*, *Mollusca*, and *Crustacea* of the lower grades. From the Silurian rocks, in addition to remains of animals of the classes before-named, the oldest known Vertebrates have been obtained, consisting of ganoid and placoid fishes.

The earliest traces of insects at present known, were discovered in the upper portion of the next series—the Devonian or old red sandstone. They consisted of a few broken wings of *Neuroptera*, or

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[*] *The oldest known fossil* has been named by Dr. Dawson Eozoon canadense. Sir Charles *Lyell observes of it*:—"*It appears* to have grown one layer over another, and to have formed "*reefs of limestone*, as do the living coral-building polyp animals."

[†] *Foraminifera.*

Pseudo-Neuroptera, allied to the *Ephemeræ*, and were obtained by Mr. C. F. Hartt, in certain plant-bearing shales (of Devonian age) near St. John's, New Brunswick.

Although these insects are the most ancient yet discovered, and "show [*] a remarkable union of characters now found in distinct "Orders of insects," thus differing from any existing types, it is improbable that they represent the earliest forms of the class to which they belong. In all other classes of the animal kingdom with whose fossil remains we are acquainted, as well as in the vegetable kingdom, the simpler forms precede the more highly organized. There seems no reason for supposing that the *Insecta* formed any exception to this rule, and we may fairly assume that the earliest types of this class were likely to have been smaller in size, simpler in form, and even less specialized than these remarkable Neuropteroid insects of the upper Devonian period; and that they had probably existed for ages before that epoch, as had representatives of the *Crustacea*, the *Mollusca*, and even the *Vertebrata*.[†]

Reasoning from the analogy which one may assume to exist between the *Insecta* and other classes of the animal kingdom in progressive development, it seems not unlikely that further researches in earlier Devonian strata, and possibly in rocks of even greater age, may bring to light still more ancient forms of insect life, as different from those of the present day, as are the fishes of Devonian[‡] age from existing Orders.

I will now pass on to the insects of the carboniferous period, the next in the ascending order of Geological succession to the Devonian.

No insects have been found in the carboniferous or mountain limestone, but from the coal measures of Gt. Britain, Belgium, Germany, and America, a considerable number have been obtained, including nearly ninety species.

With the exception of two species of *Coleoptera* and three species of *Hemiptera*, these insects have all been referred to the *Neuroptera*[§] and *Orthoptera*.

The *Neuroptera* comprise *Termes*, *Dictyoneura*, *Miamia*, *Hemeristia*, *Ephemerites*, &c., and the *Orthoptera* include *Locustidæ*, *Mantidæ*, *Phasmidæ*, and a great number of *Blattidæ*, which family appears to have been more numerously represented, and more generally distributed than any other at this period; the three *Hemiptera* have been referred to the *Fulgoridæ.*

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[*] Dr. Dawson, in the Geological Magazine for September, 1867.

[†] The oldest known type of fishes (and of Vertebrates) is described by J. W. Salter, F.G.S., in the Annals and Mag. of Nat. Hist., vol. iv, 1859.

[‡] Hugh Miller alludes to these Devonian fishes as:—" creatures whose very type is lost— "*fantastic and uncouth*—and which puzzle the Naturalist to assign them even their class."—The *Old Red Sandstone, 2nd edit., 1842.*

[§] *About five of these have*, with the Devonian insects, been placed by Dr. Goldenberg in his *extinct Order Palæodictyoptera.*

As has been stated, a considerable number of insects have been discovered in the coal measures; but, until quite recently, only *one* insect had been obtained from the comparatively more modern Permian strata. This insect, according to Dr. Dohrn*, possessed characters intermediate between those of the *Hemiptera* and *Neuroptera*, and was apparently related genetically to the two Orders: it was placed by Dr. Dohrn in an extinct Order, *Dictyoptera*, and has since been included by Dr. Goldenberg in his Order *Palæodictyoptera.*

Since this remarkable insect was described by Dr. Dohrn, a few *Blattidæ* have been obtained from Permian strata in Saxony, and have been described by Dr. Geinitz and Dr. Goldenberg.

With the Permian rocks we reach the close of the Primary or Palæozoic Period, and pass into the Secondary Period.

Secondary Period.

In the oldest formation of this epoch—the Trias—remains of insects are extremely rare, and up to the present time only five specimens have been recorded from it, viz.: two *Neuroptera*† and three *Coleoptera.*† ‡

In the Lias, remains of insects have been obtained in great quantities. The Orders represented being the *Neuroptera*, *Orthoptera*, *Coleoptera*, and *Hemiptera.*

One wing of an apparently Hymenopterous insect has been recorded by Dr. Heer, from the Lias of Schambelen in the Swiss Alps, but as no remains of insects of this Order have been obtained elsewhere from strata of this period—even in those localities in which insect remains have been found in abundance,—it is probable that the supposed Hymenopterous wing was that of an insect of another Order.

In the Liassic rocks the *Coleoptera* are far better represented than any other Order: no less than 116§ species having been determined from the Swiss Lias, and 29 from British strata of this age; and from this remote period down to the present time the *Coleoptera* appear to have been a dominant Order. It must be remembered, however, that from the indestructible nature of their elytra, insects belonging to this Order are likely to have been preserved in far greater numbers, and under much less favourable circumstances, than insects of other co-existing Orders, and may thus appear to have been comparatively more abundant than they really were.

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* "Palæontographica," 1866, Bd. xiii, p. 333, and *op. cit.*, 1869, Bd. xvi, p. 129.

† *"Die Urwelt der Schweiz,"* by Prof. Oswald Heer, 1865; and an English translation of the *same by W. S. Dallas, edited by J.* Heywood; London, 1876.

‡ *Vierteljahrsschrift der* naturforschenden Gesellschaft in Zürich. Viertes Heft, p. 297.

§ *See "Die Urwelt der Schweiz,"* &c., *ante cit.*

Next to the Lias, in ascending order, follows the Oolite, in the lower division of which is included the Stonesfield slate of England. In this formation (Stonesfield slate) a few insects have been obtained, chiefly *Coleoptera*, and two or three large species of *Neuroptera*, as well as two *supposed* specimens of *Lepidoptera*, one of which has been described and figured by Mr. A. G. Butler* as *Palæontina oolitica.*

Mr. Scudder, after an examination of this fossil (*P. oolitica*), was of opinion that it belonged to the *Homoptera* and not to the *Lepidoptera.* Space does not here permit me to enter into any discussion on the subject; but as we have no evidence of the existence of true flowers at this period, and as the *Lepidoptera* could not have existed without them, there appears to be a considerable amount of probability in favour of the correctness of Mr. Scudder's opinion as to the insect not being Lepidopterous, but its location among the *Homoptera* by no means finds favour in the eyes of Entomologists.

From the Solenhofen slate of Bavaria and the Purbecks of this country, both belonging to the Upper Oolite—in addition to *Neuroptera*, *Orthoptera*, *Coleoptera*, and *Hemiptera*,—we have the earliest traces of *Diptera*, five of which are recorded from the first-named formation and seventeen from the latter. One specimen of *Hymenoptera* is also recorded from the Solenhofen slate, and two from the Dorset Purbecks.

In the Cretaceous rocks so few traces of insects have been met with, that it is unnecessary here to allude to them.

Tertiary Period.

We now pass into the Tertiary Period in which the *Hymenoptera* first became abundant and generally distributed, and during which the *Lepidoptera*, in all probability, first appeared; at any rate, it is only in strata of this age that remains of *undoubted* specimens of the last named Order have been obtained.

The occurrence of the *Lepidoptera*, and of the Bees amongst the *Hymenoptera*, at this period, is quite consistent with the then state of development of the vegetable kingdom, and as true flowers then began to be abundant, it is likely that flower-feeding insects should have simultaneously appeared.

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* *"Lepidoptera Exotica,"* pp. 126—128; and the "Geological Magazine" for October, 1874.

In the oldest strata (Lower Eocene) of this period, but few insects have been detected; but, in the Middle and Upper Eocene, and the Lower, Middle and Upper Miocene, their remains have, in certain localities, been found in great numbers, and represent all the existing Orders.

As a rule, and possibly to some extent for the reasons before given, the *Coleoptera* are better represented than any other Order; this is especially noticeable at Oeningen, in the Valley of the Rhine, where, out of 844 species of fossil insects distributed among all the existing Orders, 518 have been referred by Heer to this Order. In some localities, however, the *Hymenoptera** are more numerous than any other insects; and in others the *Diptera*† are in a large majority.

In every case the *Lepidoptera* is by far the rarest Order, and of the butterflies only ten well authenticated species have been obtained from all the localities in which fossil insects have been discovered.

From the evidence at present obtained by Palæontological researches, it appears that the *Neuroptera* is the oldest of the existing Orders; that it was followed by the *Orthoptera*, and that these two Orders included almost all the insects of the Primary or Palæozoic period, towards the close of which the *Coleoptera* and *Hemiptera* first appeared.

Early in the Secondary or Mesozoic period the two last named Orders began to be abundant and widely distributed, and somewhat later were followed by the *Diptera* and certain families of the *Hymenoptera*.

Towards the close of this period other families of the *Hymemoptera*, including the bees, appeared, and, about the same time, or early in the Tertiary epoch, succeeded the *Lepidoptera*.‡

In the next paper I shall call attention to the correlation of fossil insects with the fossilized remains of other animals, and with those of the vegetable kingdom.

Surbiton Hill: 1*st June*, 1878.

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* From Radoboj in Croatia, 85 species are enumerated by Heer.

† From Corent and Menat in Auvergne, 30 species are enumerated by M. Oustalet.

‡ An insect discovered in 1875 in the Belgian coal fields, was for some time believed by Dr. Breyer and M. Preudhomme de Borre to belong to this Order; but Mr. McLachlan, after an examination of the fossil, decided that it was that of a Neuropterous insect belonging to the *Ephemerina*.

NEW SPECIES OF GEODEPHAGOUS *COLEOPTERA* FROM NEW ZEALAND.

BY H. W. BATES, F.L.S.

(Concluded from p. 28).

SCOPODES VERSICOLOR.

E majoribus. Suprà læte sericeo-nitens, cupreus, interdum nigrescens; corpore subtus, antennis, palpis pedibusque chalybeo-nigris, antennis basi æneis: capite suprà minus regulariter et subtilius striguloso: thorace cordato, lateribus antice obtusissime angulatis, deinde leviter incurvatis, angulis posticis rotundatis, suprà subtiliter, irregulariter, transversim striguloso: elytris suprà vix undulatis, striis haud profundis cum foveis tribus parvis cyaneo-tinctis. Long. 3 *lin.*

The eyes, though large, are much less prominent than in the typical species, and the neck, in consequence, appears less constricted. The labrum is richly metallic and punctured; the neck is vaguely rugulose-punctured, the rest of the surface of the head is covered with fine longitudinal strigæ, less sharp and less continuous than in many other species. The thorax appears, at first sight, rounded, but the reflexed margin at the dilated anterior part really forms an obtuse angle; from this the sides are sinuated, and the margin is gradually rounded off to the place where it ceases, a little before the true base. The elytra are long and ample in proportion to the anterior part of the body; the striæ are much less interrupted than usual, and shallow: they show but slight traces of punctuation, and, like the three small discoidal foveæ, are tinged with bluish-green. The species has a striking general resemblance to *Bembidia* of the section *Tachypus*.

Under stones. Otira Pass, S. Island, New Zealand (C. M. Wakefield). The *nigrino* variety appears to be rather common.

One example, from the West Coast, in Mr. Wakefield's collection, has a nearly smooth thoracic surface.

SCOPODES PRASINUS.

Suprà deplanatus, viridis, sub-opacus, antennis basi et tibiis rufo-testaceis: epistomate et labro alutaceis, collo et vertice subtiliter strigosis: thorace postice valde angustato, lateribus utrinque bidentatis, margine inter dentes biflexuoso, dorso alutaceo, transversim minus distincte striguloso: elytris suprà paulo inæqualibus, striis et foveis vix impressis, illis elongato-punctatis. Long. 2¾ *lin.*

Differs from the allied species in the nearly uniform green colour of its upper surface, including labrum, outer side of the mandibles and femora; the colour on head and thorax is metallic, on elytra more olivaceous and duller. The usual strigæ of the thorax are finer, and more irregular and indistinct than usual, and the two lateral dentiform projections very prominent, the margin between them being biflexuous.

The elytra are ample, somewhat depressed and moderately unlevel; the striæ are shallow, and formed of elongate punctures, the usual foveæ are broad and shallow.

Powell. One example, in Mr. Wakefield's collection.

SCOPODES MULTIPUNCTATUS.

Suprà cupreus, minus nitidus, interdum infuscatus: antennis palpis pedibusque testaceis: capite grosse longitudinaliter striato; thorace angusto, lateribus utrinque bidentatis, suprà grosse striatis: elytris quadratis, planis, seriatim subgrosse punctatis, foveis tribus valde distinctis. *Long.* 2 *lin.*

Readily distinguished from allied species by the distinctly bidentate sides of the thorax, and the rows of elytral punctures. The thoracic dentiform projections are placed, the anterior at the apex of the usual angular dilatation, the posterior just before the hind angles, the sides between the two being straight. The sculpture and appearance of the elytra are similar to those of the Queensland *S. æneus* (McLeay); the striæ being not impressed, but marked by rows of large, mostly oblong punctures; there is scarcely any silky gloss, and the usual foveæ are small and sharply defined. The pale legs, antennæ, and palpi are slightly varied with fuscous, particularly at the extremities.

Auckland (Capt. Broun).

SCOPODES LÆVIGATUS.

Angustior, niger, æneo-tinctus, glaber; capite inter oculos angustiori, stria frontali utrinque unica: thorace breviter cordato, marginibus reflexis, haud angulatis, dorso fere lævi; elytris ovatis, striispunctatis modice impressis vel obsoletis, foveis indistinctis; apice recte obtuse truncatis. *Long.* 1¾ *lin.*

This interesting aberrant species of *Scopodes* is of narrower form than its allies; the head is also narrower, and the eyes, though very large, less projecting. The thorax is of rounded cordate outline, free from angularity, and the lateral rims, together with the dorsal and transverse lines, are very strongly marked. The elytra are less squared at the shoulders, and the apical truncature presents no trace of sinuation: the striæ of the surface differ in strength of impression, but the three foveæ are, in all the examples I have examined, inconspicuous. The legs, antennæ, and palpi are black.

West Coast, Southern Island (C. M. Wakefield).

Scopodes aterrimus, Bates, Ann. Mag. Nat. Hist., 1874, on account of the prior use of the name for an Australian species by Chaudoir, Bull. Mosc., 1872, may be renamed *S. Edwardsii.*

40, Bartholomew Road,
Kentish Town, N.W.:
May, 1878.

ON THE PUPATION OF THE *NYMPHALIDÆ*.

BY J. A. OSBORNE, M.D.

Last year I communicated to "Nature" (vol. xvi, pp. 502–3) a discovery of mine in regard to this matter; and as my explanation of the process is altogether at variance with the account given in Kirby and Spence, and other works of the kind, I expected that it would have called forth some reply. As I have no access to any books here but my own, I should not have been surprised to hear that my discovery had been anticipated, or was even a fact well known to entomologists, as it is by no means far to seek or difficult to verify.

In watching the transformations of *Vanessa urticæ*, I found that the chrysalis was attached to the old skin of the caterpillar by a membrane sufficiently strong and permanent to support the insect during the critical last moments of pupation, and fully explaining why it does not fall down when the tail of the chrysalis is withdrawn from the old skin and thrust up to be attached to the silk. I found the same membrane, only less perfect, in the common white butterfly, and I believe I have evidence of it also in some beetles. It is now the time when the matter can be easily investigated in *Vanessa* and its congeners of the *Suspensi*; and I would, therefore, request you to call attention to it in your magazine, or if the thing is already known, that you would kindly inform me of the fact. I have still some of the specimens prepared last year to show the membrane *in situ*, and will be happy to forward them for inspection, if required. I may say that I bought some books treating of the metamorphoses of insects, with the hope of clearing up this matter, but have hitherto failed to obtain any information on the subject.

Milford, Letterkenny:
24th June, 1878.

[We reprint below the letter to "Nature," referred to by our correspondent, and will be very glad to know if the very reasonable explanation advanced in support of his theory has been elsewhere referred to, and also to have the results of direct experiment by others. So far as we can discover, most of the published accounts are simply copied, or extracted, from Réaumur. That most original of British entomologists—George Newport—in the article "*Insecta,*" in Todd's Cyclopædia of Anatomy and Physiology, vol. ii, pp. 876, 877, gives a much detailed account of the method of pupation of *Vanessa urticæ, but misses all mention* of the critical moment when the tail of *the chrysalis is withdrawn from* the cast-off larval skin; and our valued friend Mr. Buckler has apparently likewise not accounted for this critical moment in his description of the transformations of *Limenitis Sibylla*, published in this magazine, vol. iv, pp. 33–35.—Eds.]

[Last year (Nature, vol. xv, p. 7) I communicated the result of some experiments on the caterpillars of *Pieris brassicæ* from which it appeared that, when these are artificially converted from *Succincti* into *Suspensi* by cutting the loop before the exclusion of the chrysalis, a certain number (a third or fourth of the whole) succeed in attaching themselves to the silk by the hooks in the tail of the chrysalis in the manner of the true *Suspensi*. I have repeated the experiment this year with a like result, and I have also had the satisfaction of witnessing the process of successful exclusion, and comparing it with that of the chrysalis of *Vanessa urticæ*. The method is essentially the same, except that the rapid and assured precision with which the *Vanessa* chrysalis thrusts up its tail and lays hold upon the silk, is replaced in *Pieris* by long and laborious efforts, as if the tail were just a little too short to reach the silk.

I have likewise made similar experiments with another of the *Succincti*—*Anthocharis cardamines*—with the following results:—In seven instances I cut the loop (and sometimes a second one) which the caterpillar had spun; and in all the chrysalis was excluded without falling down; but in no case was the tail of the chrysalis withdrawn from the pocket of the old caterpillar-skin, so that its suspension is directly from the latter. In eleven cases in which I did not interfere, only two chrysalids were excluded in the normal way, *i. e.*, vertically, with the head up, a girdle round the insect and the chrysalis-tail withdrawn from the old skin and attached immediately to the silk on the stem of the plant. In three other cases in which a loop was spun by the caterpillar, the chrysalis seems to have turned upside-down during exclusion, the tail being now uppermost, the *loop twisted*, and the hooks fastened in loose silk upon the plant-stem. Six caterpillars either spun no loop at all or one so insufficient that they became *Suspensi* of themselves before exclusion began, and where all but one (which fell down) successfully excluded in this position—the tail of the chrysalis, however, being still retained within the pocket of the old skin.

The most interesting and curious point in the transformation of a caterpillar of the *Suspensi* is the manner in which the newly-excluded chrysalis is kept from falling, while its hook-furnished tail is being withdrawn from the old skin of the caterpillar and made fast in the cone of silk to which the latter was attached. I am ignorant whether any other explanation of this process has been given than that, I believe, originally communicated by Réaumur and detailed in Kirby and Spence, vol. iii, pp. 208, 209, and repeated in such recent works as Figuier's "Insect World," from the English edition of which work by Prof. P. Martin Duncan (1872), p. 148, I quote the following account of the pupation of *Vanessa urticæ*:—"But here comes the culminating point, the most difficult part of the operation. The chrysalis, which is shorter than the caterpillar, is at some distance from the silky network to which it must fix itself; it is only supported by that extremity of the caterpillar's skin which *had not been split open*. It has neither legs nor arms, and yet it must free itself *from this remaining part of* the skin, and reach the threads to which it is to suspend itself. *The supple and contractile segments of the chrysalis* serve for the limbs

which are wanting to it. Between two of these segments, as with a pair of pincers, the insect seizes a portion of the folded skin, and with such a firm hold that it is able to support the whole of its body on it. It now curves the hinder parts slightly, and draws its tail entirely out of the sheath in which it was enclosed," &c. (The italics are mine.) How this can be conceived possible, considering the utterly soft condition of the newly-excluded pupa, and that the caterpillar skin is now "reduced to a packet so small that it covers only the end of the tail of the chrysalis" (*loc. cit.*), in which, moreover, there are no longer any free segments, I cannot understand. On the other hand, it is very easy to show that the last and sufficient bond of connection between the chrysalis and the old larva-skin is *a membrane extending from the lining of the latter to the anterior horns of the two lateral ridges bounding the anal area of the chrysalis.* I have prepared several specimens showing this membrane still intact, and should be happy to forward one or two, if required, for inspection. I find it in all three species of butterfly mentioned above, and I believe it is to the persistence of it unbroken that is owing the continued suspension of my chrysalides of *Anthocharis.* I have tested its strength to sustain the weight of the chrysalis, and the time during which it resists desiccation and the writhings of the insect, the obvious object of which is, not to get rid of the old caterpillar-skin, but to rupture this membrane after the chrysalis has made good its tail-attachment to the silk.
J. A. OSBORNE.

Milford, Letterkenny.]

DESCRIPTION OF THE LARVA OF *CIDARIA RETICULATA.*

BY WILLIAM BUCKLER.

For some years Mr. J. B. Hodgkinson of Preston has endeavoured to find the larva of this rare and local species, until at length, in August, 1876, success attended his efforts, and, in 1877, he again found the larva, and was lucky enough, during the summer, to prove the identity of those found the year before, by breeding a specimen of the moth, as recorded by him in this Magazine, vol. xiv, p. 67. In both years Mr. Hodgkinson sent me a couple of larvæ and occasional supplies of the food plant, though, from an unlucky accident during winter, I was unable to produce an imago from the first larvæ, but have now been able to breed a specimen on the 9th of this present July. Mr. Hodgkinson's experience is somewhat different, as he tells me he has bred only ten out of quite a hundred larvæ.

With this species there are more than usual difficulties to contend with in rearing the larvæ at any great distance from the growing food plant, *Impatiens noli-me-tangere*, a native of woods bordering Windermere; for this plant, when gathered, is quite unsuitable for transporting far, because if the least exposed to air it rapidly shrivels up, or when confined in a tin just as rapidly turns mouldy; although the larva will, when pressed by hunger, feed on flowers and tender leaves of the common garden balsam, yet it will not thrive unless it has occasionally some of its natural food plant, the seed vessels of which it eats out apparently in preference, though it also will eat the leaves if they are in good condition.

The habit of the larva, like that of many other Geometers, is to be perfectly quiescent on the stem of the plant all day, looking rather shorter and stouter than when it wakes up at sunset, and feeds, and continues to do so at intervals throughout the night, for then it stretches itself to the full extent as a very active looper, lively enough.

When half-an-inch long, the young larva is very slender, and often rests on a stem with its head and next two segments bent backwards, and anterior legs extended free; its colour at this stage is a tender yellowish-green, more or less tinged with faint brownish-pink, and with whitish sub-dorsal lines: after moulting, and during further growth, its semi-transparent skin indicates very well, day by day, on what it has nourished itself from one night to another, whether on the flowers or on the leaves of the substituted food of balsam, for at one time the body beyond the thoracic segments would be light bluish-green, at another time pinkish-green or much suffused with deep pink, and whenever it could return to its natural food would become of a more subdued tint of uniform yellowish-greenish.

When full fed and about to change, it contracts in length a little, and appears stouter while it loses its lively colouring, grows torpid, holds on to any object occasionally with the anterior legs only, and elevates the hinder legs a little, quite free: this curious posture I observed with the first two larvæ of 1876, when the leaves of balsam were removed, and only a mixture of peat earth and leafy mould remained in their cage, and by the next morning (Sept. 24th) both had buried themselves. But in the case of the two larvæ I received on the 12th October, 1877 (one much smaller than the other), I saw in the evening of the 15th the largest had crept between two leaves of the balsam, and a few reticulated silk threads could just be detected around it, and by the 19th it had evidently made up, as the leaves then withering had become closely twisted together in somewhat of a cylindrical form: at this time the smaller larva, which previously had fed fairly well, appeared to be dead or dying, but on placing it in he sun for a few minutes, it revived and seemed lively, but the next morning I saw it had not fed and was again torpid, and, greatly to my surprise, already showed signs of contraction for pupation as it lay under a small bit of moss, although its previous length had not exceeded five-eighths of an inch, and there on the surface of the earth it became a naked pupa on the 29th, and, by the end of November, had died and shrivelled up.

The full grown larva measures seven-eighths of an inch in length, and is of a slender proportion, stoutest at the 9th and 10th segments, from whence it tapers gradually forward, though most from the 3rd segment to the head, which is very small and narrow, with the mouth extended in front; it tapers also just a little towards the anal extremity: the 2nd segment rather short, the others moderately well defined and tolerably plump, with the usual transverse wrinkles of the genus just visible: the colour of the head is very pale watery-greenish, with a fleshy tinge, the thoracic segments (generally paler than the rest of the body) are of a light warm pinkish yellow-green, and sometimes the three or four hinder segments are similar, while those of the middle of the body are deeper coloured, of rather stronger green inclining a little to slaty or pinkish, or else much the same pinkish yellow-green throughout, the sides often deeply tinged with pink: conspicuous on either side of the back is a whitish or faint yellowish-white opaque sub-dorsal stripe, the dorsal vessel of brownish-red continuous on the thoracic segments shows obscurely through the skin of the back as though deep below it, in some parts pulsating between whitish threads, but at the segmental divisions is strongly and clearly marked on the skin as a spear point, or thick elongate spot of dark red, often prolonged on one or two of the hinder segments: the anterior margin of the anal legs is pale primrose-yellow, very fine brown trapezoidal dots are sometimes noticeable on the back; on the belly a central yellowish stripe; the small flesh-coloured spiracles are situated on the fine tracheal whitish thread which shows distinctly through the clear skin, this assimilates well with the internal pale fibres which show through the stem of its food plant.

The pupa is about seven-sixteenths of an inch in length, of a plump figure, the wing covers rather prominently developed, their rays distinct, the abdomen convexly tapering to a pointed tip, which is furnished with two small converging spines, the surface has a fine punctate roughness, and the colour is light ochreous-brown, rather shining.

Emsworth: July 12th, 1878.

DESCRIPTIONS OF TWO NEW SPECIES OF *TRICHOPTERYX*, AND RECORD OF THE CAPTURE OF *T. VOLANS* IN BRITAIN.

BY THE REV. A. MATTHEWS, M.A.

A short time ago, I received from Mr. Champion a series of *Trichopterygia* for examination, of which the greater part had been taken by himself in Scotland. This series, although by no means extensive, contained more rare species than I ever saw before in such close contact. Besides examples of *T. longula*, *T. picicornis*, and other good species, I found three specimens of *T. volans*. This insect had previously been found by Col. Motschulsky alone, and though I have for a long time expected to meet with it in this country, I have hitherto searched for it in vain. But *T. volans* was not the most important or interesting member of the group, for it contained seven examples of a distinct and pretty species hitherto undescribed; this I now propose to name after its discoverer, whose perseverance and success in the pursuit of the *Trichopterygia* well deserve to be recorded in their nomenclature. The position of this species in the British list will be between *T. attenuata* and *T. fascicularis*; *T. volans* must be placed immediately after *T. sericans*.

While comparing Mr. Champion's specimens of *T. volans* with others of the same genus reserved in my own cabinet for future examination, I resolved to describe one species, which I am fully persuaded is truly distinct. It has always been my habit to put by specimens which would not coincide with known species for future examination, labelled "n.s. ?" Thus I have many whose specific value has not been determined by the subsequent capture of other similar specimens; they may possibly be only varieties, at any rate, I do not choose to publish them as distinct species without further corroborative evidence. But in the case of this species, no such uncertainty exists, since three examples have occurred precisely similar to each other: they may be readily distinguished from their congeners by the outline of the thorax, of which the posterior angles are enlarged in the peculiar curve of the bill of the Puffin, *Fratercula arctica*. This species must be placed next in succession to *T. grandicollis*.

TRICHOPTERYX CHAMPIONIS, *n. sp.*

Angusta, elongata, convexa, obscure-castanea, nitida, pilis fulvis parce vestita; capite parvo fronte rotundato, oculis parvis haud prominentibus; pronoto modico ad basin latissimo, lateribus leviter rotundatis, tuberculis minutis ordinibus sinuatis indistinctis dispositis, interstitiisque nitidis, leviter reticulatis, ornato, *angulis posterioribus elongatis; elytris brevibus valde attenuatis,* pronoto parum angustioribus, *ordinibus transversis sinuatis leviter asperatis; abdomine longe exserto obtuso; pedibus atque antennis longis læte flavis.* L. c. $\frac{7}{16}$ lin., = .87 mm.

Head rather small, indistinctly tuberculated; eyes small, not prominent; antennæ large, bright yellow. Thorax moderate, very convex, longer and broader than the head, widest at the base, with the sides rounded and strongly margined, covered with very small tubercles in indistinct wavy rows, with the interstices very shining and faintly reticulated, posterior margin arcuated, with the angles much produced, the margin and angles yellow. Scutellum very large, rather deeply asperate. Elytra very convex, narrow, and much attenuated posteriorly, about as as long but narrower than the head and thorax, faintly asperate in transverse wavy rows, with the apex slightly rounded and pale. Abdomen obtuse, very much exserted, with five segments uncovered, the terminal segment minutely tridentate. Legs moderate, bright yellow. Under-parts dark castaneous, with the edges of the segments paler.

Seven examples of this distinct and pretty species, which may be known by its narrow form and castaneous tint, were in the collection of Mr. Champion. They were found some years ago in Wicken Fen, near Cambridge.

TRICHOPTERYX FRATERCULA, *n. sp.*

Sat brevis, lata, nigra, nitida, pilis brevibus fulvis vestita, capite sat magno et lato; pronoto modico, postice valde dilatato, ante basim latissimo, angulis posterioribus latis, apicibus parum contractis, tuberculis minutis, distantibus, ordinibus sinuatis, remotis dispositis, interstitiis profunde et confertissime reticulatis, sive alutaceis, ornato; elytris sat brevibus, capite atque pronoto angustioribus, fere pariter longis, ordinibus sinuatis, remotis, sat leviter asperatis, apicibus latis dilutioribus; pedibus læte flavis; antennis totis nigris. L. c. $\frac{6-7}{16}$ lin., = .75—.87 mm.

Head large, broad in front, covered with minute remote tubercles in nearly straight rows, with the interstices shining and reticulate; eyes large and rather prominent; antennæ rather short, pitchy-black; palpi black. Thorax large, longer and much wider than the head, very convex, widest before the base, with the sides rounded and broadly margined; the upper surface closely reticulated, or alutaceous, with minute remote tubercles arranged in distant wavy rows, the posterior margin faintly sinuated, with the angles broad, much produced, and dilated on their exterior edge, somewhat in the shape of the bill of the Puffin, *Fratercula arctica.* Scutellum large, triangular, deeply asperate in transverse rows. Elytra short, slightly attenuated posteriorly, about as long as but narrower than the head and thorax, moderately asperate in rather distant transverse rows, with the apices broad and rounded, yellow, with the extreme edge white. Abdomen considerably exserted, broad, with the apex obtuse, faintly tridentate. Legs rather short, robust, yellow, with the femora dusky. Under-parts entirely black.

This species may be distinguished from others by the enlarged and peculiarly curved posterior angles of the thorax, and also by the superficial sculpture of the same part. In the British list it must be placed after *T. grandicollis*, although several exotic species would intervene. Three specimens were found by myself near Gumley.

Gumley: June, 1878.

REMARKS ON SOME BRITISH *HEMIPTERA-HETEROPTERA.*

BY DR. O. M. REUTER.

(*Continued from Vol.* xiv, *page* 245).

GLOBICEPS FULVIPES (Saund., Synops., ii, p. 279, 2). Concerning *G. fulvipes*, Scop., Mr. Saunders says, *l. c.*, "A very doubtful species," and he describes it only by the following lines: "Extremely like the preceding *(flavomaculatus)*, but smaller, and with the basal spot of the elytra truncate posteriorly, and not produced along the lateral margin." I, however, think that *G. fulvipes* is a very good species, and perfectly different from *G. flavomaculatus*. The latter lives not uncommonly among grass, and especially on nettles, &c.; but *fulvipes* is a scarcer species, exclusively occurring on small *Salices*, especially on *S. repens* and *rosmarinifolia*, and also on *Betula nana*. Moreover, the larva and nymph of the two species have a different colour, and are more dissimilar than the imagines (*vide* Revisio crit. Capsin., pp. 118, 119). The following characters are sufficient to separate *fulvipes* from *flavomaculatus*:

MALE.

G. FULVIPES.	G. FLAVOMACULATUS.
Vertex *not convex*, its margin *in the whole width* carinate, the carina *straight;* on each eye a distinct foveola. Pronotum *wider*, with the calli less distinct and *scarcely convex*. Corium with a small basal spot.	Vertex *convex*, its margin only *in the middle* with a transverse, short, *curved* carina. Pronotum *narrower*, with the calli distinct and *convex*. Corium with a larger spot below the base.

FEMALE.

G. FULVIPES.	G. FLAVOMACULATUS.
Head from the side with the vertex *scarcely raised* above the eyes. Pronotum with *low* calli. Corium with the spot below the base truncate posteriorly.	Head *very globose;* from the side with the vertex very convex and *highly raised* above the eyes. Pronotum with *convex* calli. Corium with the basal spot produced along the lateral margin.

MACROCOLEUS SORDIDUS (Cat., 38, 4), and ONCOTYLUS PUNCTIPES (Cat., 38, 2). Mr. Douglas has kindly communicated a specimen of his *M. sordidus* (Ent. Mo. Mag., iv, 49), and also of his *Oncotylus tanaceti*, in Brit. Hem., i, 394, 2, which latter in the Catalogue is further erroneously named *O. punctipes*. Examining these specimens I have found that both are only the ♀ of *Tinicephalus hortulanus*, Mey., a species not cited in the Catalogue of Messrs. Douglas and Scott, but described by Mr. Saunders as *Macrocoleus hortulanus* (Synops., p. 296). I can therefore confirm the synonymy given by this last author (*l. c.*). The true *Capsus sordidus*, Kirschb., is = *Macrocoleus tanaceti*, Fall., Reut., Saund., *nec* Fieb., *nec* Doug. and Scott. *Oncotylus punctipes*, Reut. (= *O. tanaceti*, H.-Sch., Fieb., *nec* Fall., *nec* Doug. and Sc.) is very different from the species with the same name in the Catalogue of Douglas and Scott; the former is a true *Oncotylus*, and not found in Britain.

PSALLUS. To my mind, and also according to Mr. Saunders, *P. alni* and *P. sanguineus* (Cat., 41, 2 and 3) are only varieties of *one* species (*vide* Rev. crit. Capsin., p. 176). *P. distinctus* (Cat., 41, 9) is likewise a variety of *P. varians* (Cat., 41, 8). I have seen perfectly different coloured varieties of *P. diminutus*, representing a different species, as well as *P. distinctus*.

NEOCORIS SCOTTI (Cat., 42, 2) is only a variety of *N. nigritulus*, Zett., as cited by Mr. Saunders (Synops., 301, 6). I have found it in Finland *in copula* with the typically coloured form.

CAPSUS CAPILLARIS (Cat., 43, 1). This is the sole Scandinavian species which can be regarded as *Cimex laniarius* of the Systema Naturæ, 726, 75 (described from Sweden). The diagnosis of Linné accords very well with the var. *danicus*, Fabr.

CAMPTOBROCHIS PUNCTULATUS (Cat., 44, 1). The British species of *Camptobrochis* is not *punctulatus* of Fallén, but *lutescens*, Schill. (= *punctulatus*, Fieb., *nec* Fall.), a species not yet found in Sweden. I have examined several specimens communicated by Mr. Saunders. The *C. punctulatus*, Fall., H.-Sch., Reut., Saund., is = *C. Falleni*, Fieb., erroneously cited by Messrs. Douglas and Scott as synonymical with their species.

(To be continued).

Psylla rhamnicola bred: description of the nymph.—Towards the end of last month I paid a visit to Purley Downs for the purpose, if possible, of learning something about the earlier stages of the above-named species. The large tree of *Rhamnus catharticus* which grows in the valley, well known, I daresay, to many entomologists, and where I took the original specimens of *P. rhamnicola*, was the first to which I directed my steps, and after examining the leaves for some little time, I observed first one and then another small creature running about upon them. I at once took out my pocket-lens, and discovered they were the nymphs of some species of *Psylla*. I then set to work to beat the branches into my sweeping net, and in a short time had the satisfaction of collecting into a tin box a goodly number of these individuals. On reaching home I turned them out into a wide-mouthed stoppered bottle, into which I had put several of the leaves of the tree, and within two days thereafter I was delighted to find that some of them had already attained the perfect state. On their first entrance into this state both males and females are entirely green, but within a few hours afterwards the head and thorax begin to assume a reddish tinge, and the short dark streak on the dorsal margin of the elytra, adjoining the apex of the clavus, becomes more conspicuous. Several times afterwards I observed a male and female sitting with their heads towards each other, and at such a distance that the apices of the antennæ just touched; these they moved slowly up and down, but whether this motion meant anything I had not an opportunity of determining. On what part of the leaf the eggs are deposited, and what peculiarity the leaf assumes, I am still ignorant; these are matters for future investigation. Now for a brief description of the nymph.

The entire creature pale lively green, except the cases containing the elytra, which are pale buff coloured. *Head* angulate in front, and with a stout central longitudinal keel. *Eyes* dark reddish-brown. *Antennæ* pale, the joints indistinctly dark at the apex, except the two terminal ones which are black. *Thorax* pale lively green. *Elytra*-cases pale buff, with the rudiments of the neuration visible upon them. *Legs* pale green. *Abdomen* pale lively green, somewhat oval, flattish-convex, round the apex some eight or nine short, stout, dark brown hairs. Length, nearly one-eighth of an inch.—John Scott, 1, St. Mildred's Terrace, Lee: *8th July*, 1878.

The Natural History of Psylla succincta.—In the "Sitzungsberichte der k. Akademie der Wissenschaften: Mathematisch-Naturwissenschaftliche Classe," xviii Band, 1855, Dr. Ernst Heeger described, as new, *Psylla succincta*, and as (except in Dr. Puton's "Catalogue des Hémiptères," where it is enumerated among the species marked "?") I am not aware that it has since been noticed, I have thought it desirable again to mention it, and to this end transcribe its natural history. The food-plant has long been naturalized in Britain, and it is not improbable that the insect, which seems capable of withstanding considerable hardship, may have been introduced with the rue and be also naturalized with us. At any rate, the account is interesting.

"I found this pretty diminutive creature several times on *Ruta graveolens*, and, without imagining that it was undescribed and only little known, I endeavoured, during the past year, to observe it both in the garden and in the house, and for this purpose I brought several pairs into my room, where they multiplied so much that at the end of the autumn the plant which I had given them to feed on was reduced to a ruinous condition. I left plant and insects in the window of the unheated room for observation after winter was over, and in April following I placed a fresh plant close by, which in a few days was stocked with both larvæ and perfect insects of the *Psylla*.

"The newly developed insects couple in the day-time, and in warm weather remain together for several hours; they always live for several days afterwards, but the males die before the females. The fecundated female, in 4 or 5 days, lays her eggs in the day-time, singly, and by preference on the edges of the leaves, and when these are all occupied, then on the leaf-stalk and green twigs.

"After from 8 to 14 days the wingless larvæ appear; and, sucking a leaf-stalk or young twig, remain stationary up to the time of their first moult, which occurs in from 9 to 12 days, after which they leave their place, having already obtained rudiments of wings; then, after similar periods, follow the second and third moults, and generally after the last they do not move. They have already attained proportionately large wing-cases, and in the same skin the transformation to the nymph and the development of the perfect insect in a like space of time takes place; so that about the middle of June the second generation begins.

"A female in 5 or 6 days lays 30 or 40 eggs, and by the irregular development of larvæ therefrom it happens that in August an extraordinary number of insects, in all stages of existence, are present on a plant, and ruin it. After the second moult the larvæ exude the downy bluish mass, with which an overloaded plant is often entirely covered."

Then follow the description of the egg, larva, and imago in long detail, illustrated by figures. The size of the perfect insect is not given, but it has the body of vermilion colour, the wings cloudy, with pale brown markings, the antennæ yellow with the joints anteriorly black-brown. The head, which posteriorly is but little narrower than the pronotum, has on the face and posterior part two light yellow dots; the eyes are dark violet, and the legs are almost sulphur-yellow. If any one should find such a creature on the rue it may presumably be *Psylla succincta*, and in such a case I should be happy to determine if it be the species.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 18*th June*, 1878.

Phylloxera in Scotland.—Dr. Masters recently sent me a small vine-leaf (from a hot-house in Scotland), which, although scarcely 1½ inch across, has on it about 35 well-marked *Phylloxera*-galls. I have the best of reasons for believing that this pest is proving as destructive in some hot-houses in Britain as it is to the vines of the south of France, &c., grown in the open.—R. MCLACHLAN, Lewisham: 16*th July*, 1878.

Singular habit of Chrysocorys festaliella.—I was much startled yesterday with the information that this insect uses its hind-legs much in the same way that *Stathmopoda pedella* and *S. Guerini* use theirs'. Sir Thomas Moncreiffe had had a specimen in a glass-topped box and had watched its movements with great interest for a considerable time. It would rest with its hind-legs stuck out, and then suddenly jerking down its right leg would make a demi-pirouette to the left; then down would come the left leg and the right being lifted up again, there ensued a demi-pirouette to the right, or it would put down both legs simultaneously and be propelled straight forward. The motions of a *Stathmopoda* are very leisurely, but a *Chrysocorys* is a far more sprightly insect, and the motions are accordingly far more energetic.

The wonder seems to be that such a habit should never have been observed before. Perhaps, but for the existence of glass-topped boxes now-a-days, the habit would still have escaped observation.—H. T. STAINTON, Lewisham: *July*, 1878.

Food-plant of Elachista stabilella.—The grass this species feeds on is *Aira cæspitosa*; it was so stunted and small when I first found it, on the chalk in the spring, that I did not recognise it. The mined tips of the leaves become yellow, exactly resembling the ordinary decay of the leaf.

The insect seems to me one of the commonest *Elachistæ* round here, and to be out all the season. I find that I have two specimens caught on the limestone near *Doncaster.*—*W. WARREN*, 51, Bridge Street, Cambridge: July 9th, 1878.

Micro-Lepidoptera in Australia.—Our collecting season is now almost closed (although insects are really to be found all the year round in this climate), and it may, therefore, interest some if I record the progress Micro-Lepidopterology has already made in Australia.

I landed in December, the heat of summer, and have, therefore, only had half a year's collecting; and as I have been prostrated during the last two months by an attack of low fever, I had only three months of actual collecting; but I venture to assert that in the matter of *Micro-Lepidoptera* Australia stands pre-eminent among the nations of the earth. Other groups of *Lepidoptera* are, I think, scarcer than in England; but in favourable localities Micros swarm to a degree which I have never seen equalled, except once on a July evening in the Engadine Valley. During these three months, from December to March, I collected 450 species (not including *Pyrales*), and have recived about 200 others from correspondents, 650 in all. In the collections of residents, consisting (as regards Micros) solely of the larger species, I have seen some 500 or 600 more; and it is a significant fact that in these collections hardly one-tenth of the species, although all taken round Sydney, were identical with mine. I should observe that, the soil being very sterile, the aboriginal bush immediately surrounds the city, and the extent of ground to be explored is therefore considerable.

Mr. G. H. Raynor, formerly of Cambridge, is established at Parramatta, some 16 miles inland, and has proved a most valuable coadjutor, having also furnished me with types of all the species taken during his residence last year at Melbourne; and having converted to the science Mr. Burkitt and divers of the pupils at the King's School, Parramatta. The zeal of Mr. Burkitt furnished us with a pole-lamp, mounting six paraffin burners, with which immense execution was done (on one good night I got nearly thirty new species); and I suppose such a sight as our procession to the scene of action was never before seen in Australia: to wit, two boys carrying the lamp on a pole; two more carrying the tripod of poles on which it was to be hoisted; a fifth boy with a net; and our three selves also with nets, formed a spectacle which produced a visible impression on the spectators. Not but what the inhabitants of Parramatta were tolerably familiar with our eccentricities, and would remark without surprise, "Oh, there's Mr. Burkitt up a lamp-post; any *Chilos* this evening?" It being generally known that two species of that genus were among the special objects of our search.

My collection comprises a fine *Schœnobius* (both sexes abundantly by wading in the Parramatta river among reed-beds), and the two species of *Chilo* above mentioned; *Crambus*, 11; *Eromene*, 2; *Phycidæ*, 21, nearly all of European genera and not remarkable. The *Tortrices* number about 50, mostly dull and uninteresting in comparison with English species; a large proportion belong, or are allied, to the typical genus *Tortrix*. One of the most interesting is a little species remotely allied to *Grapholitha*, the larva of which *mines* irregular blotches in the leaves of *Smilax glycyphylla* (the plant from which sarsaparilla is procured), thus differing in habit from every known species of the group. The *Tineina* form the bulk of the collection; the principal European genera as yet recognised (a considerable number of species being still unexamined) include, *Choreutis*, 1; *Simaethis*, 1; *Atychia*, 1, nearest to *pumila*; *Blabophanes*, 3; *Tineæ*, 4, not including *tapetzella*, *pellionella*, and *biselliella*, *which all abound*; *Incurvaria*, 1; *Nemotois*, 2; *Plutella cruciferarum*, of course in its element; *Depressaria*, 1, doubtful; *Cryptolechia*, above 60, I used to get a new *Cryptolechia* almost every time I went out, so that the genus bids fair to rival the original *Gelechia*, unless it also will bear sub-division; *Gelechia*, the various species of this group I have not not yet attempted to grapple with, but they number about 20; for the rest of the *Gelechidæ*, there are undoubtedly many new genera, belonging to the groups of *Hypsolophus* and *Pleurota*, but no species that accord with European genera; *Harpella*, 2, very similar to *forficella* and *bracteella*, but half their size; *Dasycera*, 1; *Œcophora*, about 30, showing great range of form and colouring; *Glyphipteryx*, 5, most of them exceedingly handsome, especially one with yellow hind-wings; *Laverna*, 3; *Stagmatophora*, 2 brilliant species; *Stathmopoda*, 2, and also two extraordinary allied genera with the same habit of erecting the posterior-legs in the air, one a beautiful coppery-red insect with plumose antennæ, allied to *Atkinsonia*; *Cosmopteryx*, one so exactly resembling *Scribäiella* in every minute detail that I see no distinction but the black ground-colour; it frequents dry places, and the larva probably feeds on a grass; *Batrachedra*, 2; *Heliozela*, 1; *Elachista*, 3, one very near *nigrella*; *Coleophora*, 1, and also two forms of cases; *Gracilaria*, 6; *Coriscium*, 1, bred from leaf-mines on a *Phyllanthus* (a small tree belonging to the *Euphorbiaceæ*); *Ornix*, 2; I may mention here that one typical *Gracilaria*, the *Coriscium* very often, and a new genus between *Coriscium* and *Ornix*, stand on their heads like *Argyresthia*; *Lithocolletis*, none yet, perhaps owing to the season; *Lyonetia*, 2; *Opostega*, 1; *Bucculatrix*, 2, one bred from *Eucalyptus*, the larva and ribbed cocoon resembling those of European species; *Nepticula*, 2, one bred from the *Phyllanthus*, and also mines of other species.

I will close this already too long account (omitting any notice of the many new and curious genera) by mentioning three characteristic peculiarities of the Australian *Tineina*. These are (1) the very great comparative frequency of yellow hind-wings, which occur in at least five per cent. of the entire group, and are scattered indiscriminately through the families, appearing even in the narrow winged *Elachistidæ*; compare with this the fact that in England the proportion is 2 in about 700: (2) the unusually large proportion of rough woolly or tufted heads, occurring in all families, but especially the *Gelechidæ*, and making their boundaries unpleasantly vague: (3) the much increased number of larvæ which form for themselves an efficient shelter by spinning a dense web in common, or tough silken galleries coated with excrement, or even (as in *Cryptophasa*, and certainly also some smaller species) boring into wood and closing the hole with a barricade of silk and refuse. The reason of this I believe to be the superabundance of ants, which swarm in great variety on every tree and plant, and which I have seen destroying unprotected larvæ. The above generalisations, which are certainly founded on fact, seem to me worthy of attention.—EDWARD MEYRICK, 243, Macquarie Street, Sydney: *May*, 1878.

Captures of Lepidoptera at Bishop's Wood, near Selby.—Amongst the captures a few days' visit to Bishop's Wood, at Whitsuntide, produced, were the following species, including larvæ and imagos: *Eurymene dolobraria*, *Tephrosia biundularia*, *Asthena luteata*, *Eupisteria heparata*, *Melanthia albicillata*, *Cidaria silaceata*, *Cymatophora duplaris*, *Tethea subtusa*, *Tæniocampa populeti*, *Himera pennaria*, and *Nyssia hispidaria*.

We also took Eupithecia lariciata at Brough, not uncommonly. There were three imagos of ***Anticlea badiata*** captured in very fair condition, and the day after I swept several half-fed larvæ of the same insect out of the hedge-row. I think this is such an unusual occurrence of *badiata* that it merits a record.—S. D. Bairstow, Woodland Mount, Huddersfield: *June* 19*th*, 1878.

Incurvaria canariella bred.—On the 4th June, I bred several specimens of *Incurvaria canariella* from *Rosa spinosissima*, collected at Arnside, in North Lancashire. The late Mr. Thomas Hague, of Staleybridge, first met with this insect in the Isle of Man, where it was afterwards captured by the Rev. R. P. Murray. The first specimen I saw alive strongly reminded me of *Nemophora Schwarziella*, only that it had a yellow face and shorter antennæ; but for many years I had not seen a specimen: now, I am happy to say, I have secured a nice series of this local species.—J. B. Hodgkinson, 15, Spring Bank, Preston: *July* 1*st*, 1878.

Deilephila livornica at Knutsford.—I wish to record the capture of *D. livornica* at Knutsford on the 11th of June, by my friend, Mr. E. C. Buxton. He saw two specimens at the flowers of a rhododendron in his garden, but only captured one; last year he saw a large Sphinx at the same shrub, which he believes to have been the same species. My friend made me the offer of the specimen he captured, which is a very fine and perfect one, and I was glad to accept it, as it is a species very rarely taken in this part of the country.—Joseph Sidebotham, Bowdon, Cheshire: *July* 17*th*, 1878.

Review.

The Natural History of Hastings and St. Leonards, and the Vicinity. Published by the Hastings and St. Leonards Philosophical and Historical Society. 12mo, pp. 1—68, 1878.

This is a well got up local list of plants and animals occurring in the Hastings district, comprised in an area of about 18 miles from east to west, and 10 from north to south (so far as terrestrial or fresh-water productions are concerned), and the shore. 1868 species of insects are enumerated, of which 499 are *Coleoptera*, 923 *Lepidoptera*, the other Orders evidently very imperfectly represented by the few species collected.

Everything must have a beginning, and the Society has made a very creditable one. We hope a new edition will be soon required, in consequence of large additions to the number of species. In this it might be advisable to give more special localities, in order to show how the distribution of species is correlated with the varying geological features, &c.

Obituary.

Professor Carl Stål. By a letter from his widow and father we have the sad news that Professor Carl Stål died at Frösundavik, near Stockholm, on the 13th June last, aged 45 years. We hope to be able to give subsequently some further information of one who worked well for the science of entomology, and whose premature death gives so much cause for lovers and students of nature to lament.

Two errors occurred in our notice of the late *Mr. W. C. Hewitson* in the July No. With respect to the "Exotic Butterflies," it should be mentioned that the work was concluded at the end of the *fifth* (not the *third*) volume. It is the stock and copyright of the "British Oology" that become the property of Mr. Van Voorst, *not the specimens from which* the work was drawn up.

LIST OF THE *HEMIPTERA* OF NEW ZEALAND.

BY F. BUCHANAN WHITE, M.D., F.L.S.

(*Continued from p.* 34).

TARGAREMA, *n. g.*

Body oblong. Head triangular, broader than long, immersed to the eyes, and with them a very little broader than the apex of the pronotum; clypeus rather produced. Rostrum passing the middle coxæ, the 1st joint reaching to or nearly to the base of the head. Antennæ less than half as long as the body, the 1st joint reaching beyond the apex of the head. Pronotum slightly convex, and with a slight transverse depression in the middle, length more than half the posterior breadth; front margin about half as long as hind margin, slightly concave, transversely impressed within the margin; side margins obtusely keeled, nearly straight but rounded in front, the hind angles elevated; hind margin slightly concave in front of the scutellum. Scutellum longer than broad. Elytra complete, parallel. Legs mediocre, front femora slightly thickened, with one or more small spines near the apex below; tibiæ straight; 1st joint of the hind tarsus as long as, or longer than, the two other joints together. Hind margin of 3rd ventral segment curved forward on each side, and not reaching the margin.

Allied to *Peritrechus* and *Rhyparochromus*. Type *T. Ståli.*

23. *T. Ståli, n. sp.*

Dull chestnut-brown, variegated with paler; three basal joints of antennæ, rostrum, elytra and legs, paler; pronotum with a spot in middle of front margin, side margins especially behind, a spot in middle of hind margin (sometimes extended to front edge of the hind lobe), and a smaller spot on each side, as well as the hind angles, scutellum with the apex and a spot on each side behind the disc, corium with a streak from the base to the middle of the claval suture, three short streaks following each other on the disc, and a fourth obscure streak between the third and the outer margin, as well as the base of the latter and the commissure of the clavus, whitish-brown or brighter brown; corium with a black streak from the middle of the claval suture to the inner apical angle; last joint of the antennæ fuscous-black; membrane pale fuscous with darker streaks. The lobes of the pronotum nearly equal in length, the front obsoletely, the hind coarsely and thickly, punctured; scutellum coarsely and thickly punctured; elytra with rows of punctures, the clavus with three rows, the disc of the corium more remotely punctured; front femora with one spine; 1st joint of hind tarsus as long as the two others together.

♂ ♀. Length, 3½—4, breadth, 1¼—1¾ mm.

Several specimens taken by Captain Broun. Somewhat variable *in the intensity of the markings.*

NOTE.—In giving names to the New Zealand *Hemiptera*, I wish to commemorate not only the entomologists who have done good work in collecting the specimens, but also some of those whose labours in this order of insects are well known to all their brethren.

[As, since the above was written, Dr. Stål has gone from amongst us, I cannot allow the opportunity to pass without expressing the sincere regret with which all entomologists must regard his untimely death.]

24. *T. electa, n. sp.*

Dull chestnut-brown, variegated with paler; rostrum, antennæ, and legs paler; pronotum with a spot in the middle of the front margin, side margins (interrupted in the middle), hind angles, and three spots on the hind margin, scutellum with the sides and apex, clavus with the commissure, corium with the base of the outer margin, a streak at the middle of the claval suture, three obscure streaks following each other on the disc, and a fourth between the third and the outer margin, paler brown; pronotum with an obscure band before the hind margin, scutellum with the apical half of the disc, clavus with a streak near the inner angle, corium with a streak from the base to near the middle of the claval suture and another from beyond the middle to the inner apical margin, as well as a large irregular patch near the outer apical angle, more or less fuscous-black; membrane yellowish-fuscous. Head very finely punctured; the two lobes of the pronotum nearly equally long, the front unpunctured except behind the front margin, the hind closely but obsoletely punctured; scutellum rather remotely punctured; elytra with rows of punctures, the disc of the corium rather obscurely and remotely punctured; front femora with three spines; 1st joint of hind tarsus twice as long as the two last joints together.

♀. Length, 6, breadth, 2½ mm.

Two specimens taken by Captain Broun.

MARGARETA, *n. g.*

Body oblong, clothed with longish suberect hairs. Head rather small, longly triangular, immersed to the eyes, and with them broader than the apex of the pronotum. Rostrum reaching the hind coxæ, the 1st joint attaining the base of the head. Antennæ half the length of the body, the basal joint passing the apex of the head. Pronotum anteriorly convex, somewhat concave in the middle behind, the length equal to the posterior breadth, the front and hind margins equal in length, all the sides nearly straight, the lateral rounded in front and obtusely keeled behind. Scutellum acutely triangular, longer than broad, and somewhat depressed in the centre of the disc. Elytra complete, somewhat rounded near the middle, the clavus with three and a-half longitudinal rows of punctures. Legs mediocre, the front femora somewhat thickened, and near the apex below armed with three spines; the front tibiæ straight; the 1st joint of the hind tarsi more than double the length of the other two put together.

Somewhat related to the genus *Pachymerus.*

25. *M. dominica, n. sp.*

Rather dull brown, the upper surface as well as the antennæ and legs with pale brown hairs, the under-side shining pitchy-brown. The head (except the extreme apex), anterior part of the pronotum, and some streaks on the elytra as well as the membrane, darker brown; the antennæ (except the basal joint), rostrum, legs (femora excepted), and veins of the membrane, yellow-brown. Rather remotely and coarsely punctured, except on the somewhat wrinkled head, a transverse band before the middle of the pronotum, a small space within the inner angle of the corium, the middle of the sternum behind, and the under-side of the hind body, which are impunctate. The 1st joint of the antennæ gradually from the base to the middle, and the 2nd and 3rd at the apex, thickened, the 4th cylindrical, the 2nd longer than the 3rd. ♂ ♀. Length, 6, breadth, 2 mm.

Captain Broun (several specimens).

26. *Scolopostethus Putoni, n. sp.*

Dull testaceous-brown, more or less densely punctured; head, pronotum with front lobe and a spot on each side within the hind angles, scutellum with a spot in the middle, and the sternum, black; pronotum with three obscure longitudinal bands on the hind lobe, corium with the veins, a spot near the middle of the outer margin and another on the inner margin opposite it, the apical margin and a streak near it, the membrane (except the veins), the antennæ, coxæ, trochanters, margins of the sternum segments, and the ventral surface, more or less intensely brown or pitchy-brown; the dilated side margins of the pronotum and the extreme tip of the scutellum, sub-translucent and dirty white. Clavus with three rows of punctures. ♂ ♀. Length, 3 mm.

Two or three specimens taken by Captain Broun. Allied to *S. contractus*, H.-S.

Tribe PHYMATINA.

27. *Phymata Feredayi*, Scott.

28. *P. conspicua*, Scott. I have not seen either of these.

Tribe ARADINA.

The names of five supposed species of this section have been recorded; but two of these seem to be only synonyms. I am able to add another species to the list.

29. *Aradus australis*, Er.?

Erichson's description (made from a mutilated specimen) is so very short, that I am not certain that the New Zealand species is identical with the Tasmanian. If it is not the same, it is very closely allied.

Not uncommon. Messrs. Hutton and Wakefield.

30. *Neuroctenus Hochstetteri*, Mayr.

Not uncommon. Captain Broun.

If Walker is right in referring *Aradus thoracicus*, White, to the genus *Neuroctenus*, it is possible that *Hochstetteri* and *thoracicus* may mean one and the same insect. I do not know where the latter is described, if it has been described at all, which seems doubtful.

31. *Crimia attenuata*, Walker.

This I have not seen. Mr. Butler places the name of the other Walkerian species (*Mezira maorica*) within brackets after the name of this species, by which I understand him to mean that the two are identical.

32. *Aneurus Brouni*, Buch. White.

Three specimens taken by Captain Broun.

(*To be continued.*)

DESCRIPTION OF A NEW HOMOPTEROUS INSECT BELONGING TO THE FAMILY *CICADIDÆ*.

BY W. L. DISTANT.

TOSENA SPLENDIDA, *n. sp.*

♂. Body black. Face with the lateral borders dull reddish, with a well-pronounced, central, longitudinal impression; transversely costate, with the interstices wide and irregularly punctate. Eyes prominent, luteous and fringed behind with long hairs. Pronotum deeply furrowed, much as in *T. melanoptera*, white, with four large luteous spots: two on the disc, sub-oval, converging from immediately behind the eyes towards each other, through two-thirds of the width of the pronotum, their bases widened and separated by a space of about two millimètres; the other two somewhat larger and much more irregular, occupying the posterior lateral angles. Mesonotum very sparingly pilose—excepting near lateral borders, where the hairs are much longer and more regularly abundant,—and with two sub-cordate luteous spots on disc, parallel with the pronotal central spots, and, like them, converging towards each other at base. Metanotum with two small luteous spots at base, very indistinct in ♂, but clearly exhibited in ♀. Abdomen above pilose. Rostrum black, with a small luteous spot near base, in length just reaching the posterior coxæ. Body beneath and legs pilose; femora with a wide, central, rufous band, fore-femoral spines apparently well-developed (owing to a somewhat crushed condition of the fore-femora in type, I am unable to give a more complete delineation), drums of the usual generic size, but situated close together, and divided by a very slight emargination behind. Abdomen with a longitudinal discal row of sub-triangular reddish markings, the bases of which are situated on posterior borders of abdominal segments. Tegmina and wings, where not obscured by darker markings, transparent, exhibiting varied opaline lustre, which in some lights is found to be varied with close and regular series of transverse darker striæ. Tegmina at base narrowly dark fuscous. Costal area fuscous for rather more than half its length, nervures and nervules bright luteous, and, for two-thirds the length of tegmina, bordered on each side with fuscous. The apical border is also fuscous, very broadly so at apex, and narrowing towards inner margin, containing a sub-marginal row of pale luteous spots, which are the outer terminations of an equal number of narrow, transverse, linear, pale luteous striæ. Claval area pale greenish. Wings pale greenish for nearly two-thirds their area from base, remaining portion shining fuscous, enclosing a sub-marginal row of pale opaline spots, of which the largest is sub-costal and irregular in shape, being somewhat sub-quadrate, hollowed out externally, and produced at base towards outer edge. Nervures and nervules pale luteous, in some places tinged with green.

♀. Differs principally from the ♂ in having all the colour markings intensified, the tegminal row of sub-marginal spots, which are luteous in the ♂, being pale opaline in the ♀. The abdomen is more thickly clothed with pilosity, and the rostrum is somewhat shorter in length than in the ♂.

♂. Long. 45 mill. Exp. tegm. 124 mill. ♀. Long. 44 mill. Long., with ovipositor exserted, 49 mill. Exp. tegm. 127 mill.

Naga Hills: alt. 2000 to 6000 ft. Khasia Hills: alt. 4500 to 6000 ft. (Chinnell).

This beautiful species is interesting as showing the alliance of the genera *Tosena* and *Gæana*, which, originally placed near each other by Amyot and Serville, were by Mr. Walker separated far apart, both in the Brit. Mus. Catalogue, and in the Brit. Mus. Coll. The late and lamented Prof. Stål, in his Synopsis of the Genera of the Stridulantia (Hem. Af., vol. iv), recognised their affinity, and I think, had he lived to have seen this species, would have agreed that there is a regular transition through the genera *Tosena*, *Gæana*, and *Huechys*. *Tosena splendida* differs apparently from the other species of the genus by its paler coloration and more transparent appearance, but the last peculiarity is shadowed in *T. albata*, Dist., whilst the pronotal and mesonotal spots, which ally it to some species of the genus *Gæana*, may be seen indicated on the pronotum of *T. melanoptera*, White, in which the two discal spots are faintly recognisable, whilst the broad, pronotal, luteous band of that species appears only as the two angular spots in *T. splendida*. I have abstained from describing the neuration of the tegmina, knowing that character in many instances among the *Cicadidæ* to be most unreliable, and, in addition to the evidence I have already collected, I may state, that the neuration of the right and left tegmina in the typical ♂ specimen above described is asymmetrical.

1, Selston Villas, East Dulwich, S.E.:
August, 1878.

ON THE PUPATION OF THE *NYMPHALIDÆ*.

BY T. A. CHAPMAN, M.D.

From my earliest entomological experience, this subject, as an engineering problem, had a great attraction for me, and it was not long before I had succeeded in observing the whole process, by which the pupa, soft, and apparently helpless, gets hold of the tuft of silk which is to support it, not by getting through the end of the caterpillar skin, but by withdrawing the tail from the effete skin and passing it up behind it. Few years, until this one, have passed in which I have not repeated the observations, which possess an unfailing interest. It so happens, also, that some years ago I interested myself in the question as to the normal number and arrangement of the spiracles of insects, and as to how the various number of spiracles that occur are to be explained by the suppression of some and the varying position of others. Among the observations then made were some on the changes in the number and positions of the spiracles during metamorphosis. The pupation of the *Vanessidi* was not omitted in these observations, and yielded an item bearing on the "membrane" observed by Dr. W. Osborne. It is perhaps, therefore, fitting that I should state the result of my observations as the subject has been brought up for discussion.

It is to be noted that the process of casting a skin, whether by larva or pupa, is a process of vermiform creeping, *i. e.*, creeping without the aid of legs; the segments of the insect are soft and worm-like, but under powerful muscular control, notwithstanding their softness and the delicacy of their tegument. In the fresh pupa of *Vanessa*, for example, the segments are rounded with deep folds between, and not smoothed down, hard and telescoped as in the mature pupa. As the casting of the larva skin becomes nearly completed, the thoracic portion of the skin still covers the ventral aspect of the abdominal segments, whilst already the dorsal slit in the skin has passed so far backwards as to allow the removal of the terminal segment with its hooks.

At this critical point it is obvious, as the result of my observations, that the good old explanation of how the pupa is sustained, is largely true, that it is suspended by the folds of the larva skin being grasped in the intervals of the segments of the pupa. But there is another and at least as important an element in the case that has not, I think, been mentioned, and that is, that the interior of the larva skin and the surface of the pupa are damp or actually wet, so that by capillary attraction and atmospheric pressure they adhere with considerable firmness, and whilst they will gradually slide off each other by the vermiform movements of the pupa, they strongly resist any direct separating force, and the larva skin will not readily even peel off. The capillary adhesion of a very small area is abundantly sufficient to sustain much more than the weight of the pupa. An important element in the case is that the sliding of the skin under the vermiform movement of the pupa can only take place when there is some *point d'appui*, which in the earlier stage of the process is afforded by the different segments of the pupa, one, or rather several, so to speak, holding the skin, whilst another slides along it; but at the stage of the process we are considering, such *point d'appui* fails, and no further sliding takes place until one is gained by the attachment of the terminal hooks to the silken boss. The "membrane" discovered by Dr. W. Osborne no doubt assists to some extent in the same way (by capillary adhesion), for such a membrane there really is. This membrane is neither more nor less than the linings of the tracheæ, which are drawn out at each change of skin, and trail behind over the surface of the pupa, frequently adhering to it by the dampness already mentioned. In many insects these tracheal linings form a conspicuous addition to the cast skin, forming long white threads, as they do not shrivel together in drying as the skin itself does. Whether the intestinal lining affords any assistance in supporting the young pupa, I do not know.

Binghill, Hereford: *August*, 1878.

DESTRUCTIVE INSECTS IN THE ISLAND OF ASCENSION.

BY R. McLACHLAN, F.R.S., &c.

This little spot in the middle of the Atlantic is suffering to an alarming extent from the ravages of caterpillars, which threaten to destroy all vegetable produce, a most serious matter, when it is considered how greatly the health of its inhabitants—and especially the prevention of that dire scourge *scurvy*—depends upon a proper supply of vegetables.

A nicely preserved collection of the perfect insects (with most of their larvæ in spirits) has been forwarded to the Secretaries of the Admiralty, and submitted to me through the authorities at Kew.

It consists of nine species—two of these butterflies, the others moths of the family *Noctuidæ*. All of them may be suspected of having been introduced with plants, &c.

The butterflies are the very widely distributed *Vanessa cardui* and *Lycæna bœtica*, neither of which can cause much damage; and a Noctua larva was forwarded in error as pertaining to the *Vanessa*.

The most destructive of all is our too-well known *Agrotis segetum*, known in the island as the "black grub," and, as here, nipping off the young plants just below the surface. Another is *Prodenia retina*, not known in this country, but of very wide distribution; it appears in great numbers, and clears everything before it; in December, 1876, the Cricket Valley Crater was grown over with wild tomatoes, which were covered with the caterpillars; the tomatoes died off in April, 1877, and but few of the caterpillars were to be seen until last November, when they swarmed over the whole mountain. Another caterpillar, which is said to be seen in numbers, is that of a *Leucania*, apparently *L. Loreyi*, but it is not stated upon what it feeds; probably grasses and cereals. Two pretty species of *Plusia*—*P. aurifera* and (apparently) *P. U-aureum*—with characteristic "half-looper" larvæ, are said to be destructive to garden produce. The other moths are *Cosmophila xanthindyma* and a species of *Callopistria*, but of these the larvæ have not been observed.

Naturally the islanders seek means of ridding themselves of this plague of caterpillars; but these are very difficult to suggest. The introduction of rooks or starlings appears to be practically impossible, on account of the treeless condition of the island. The sparrow would, I think, be useless; if introduced, it would sure to keep to the houses, and moreover, the larvæ are large, and, in the case of the *Agrotis*, only at work above ground during the night. I have suggested the breeding of large numbers of ducks, if this can be done successfully in an island with so little water, and, failing these, the turning out of large flocks of fowls and guinea fowl, and building sheds for them in which to shelter and roost.

Strict attention to systematic alternation of crops is, I think, desirable; and not less so is the careful collection and destruction of all larvæ and pupæ turned up by the plough or spade.

Chemical and other agents seem to be of little service; but I know that the sprinkling of unslaked lime over the plants has been found useful in the case of *Agrotis segetum*.

An estimate of the number of land birds on the island accompanies the insects, from which it appears that there are about 25 pheasants, 400 partridges, 100 guinea-fowl, 1100 domestic fowls, 25 ducks, 50 canaries, 10 cardinal birds, and 1500 wax bills; the guinea-fowl are said to keep about the N. E. plains, 400 feet above the gardens, and live on grasshoppers and crickets; surely if these birds were pinioned or prevented from straying, they would find the larvæ equally to their taste.

The only immediate consolation I can give the unfortunate islanders is, that destructive insects, as a rule, only appear in extraordinary numbers in certain years.

Lewisham, London: August, 1878.

NEW *COLEOPTERA* FROM NEW ZEALAND.

BY D. SHARP, M.B.

(Concluded from p. 52).

CHŒRODES CONCOLOR, *n. sp.*

Rotundato-ovalis, convexus, fere unicolor, pallide testaceus, subnitidus; pedibus posterioribus minus incrassatis. *Long.* 6½ *mm., lat.* 4⅔ *mm.*

Though excessively similar to *C. trachyscelides*, White, I think this is a distinct species; in *C. trachyscelides*, unicolorous unspotted forms are rare, whereas in *C. concolor* I have not seen a spotted individual, though I have received two or three dozen specimens; *C. concolor* is only about half the size of White's species, and has the legs much thinner, and there seems to be scarcely any difference in the intermediate tarsi of the two sexes, whereas in *C. trachyscelides*, ♂, the middle tarsi are much dilated.

Sent by Prof. Hutton, in numbers, from Otago.

RHIPISTENA LUGUBRIS, *n. sp.*

Elongata, angustula, nigra, opaca, dense subtilissime punctata et fusco-pubescens; prothorace antrorsum fortiter angustato, basi profunde bisinuato, angulis posterioribus sub-prolongatis, ad humeros applicatis; elytris elongatis et angustis, apicibus vix dehiscentibus et sub-acuminatis.

Long. 6 *mm., lat.* 1¼ *mm.*

The 1st joint of the antennæ is longer and rather thicker than the 2nd; the 3rd is longer than the 1st, but similar to it in form, the 4th joint is stout, quite as long as broad, the other seven joints very short, but each giving off an appendage, and of these the first four or five are each as long as the three basal joints.

I have received a mutilated individual of this species from Capt. Broun, as No. 63, and am informed that he has found only two individuals.

I give below the characters, so far as I can see them, of this interesting species, which seems to be a very interesting form of *Rhipiphorides*, but to connect that family with the *Mordellides*; if the antennæ and head were hidden, the insect might readily be passed over as a slender *Mordellistena*.

Antennæ short, eleven-jointed, the four basal joints moderately long and stout, the other seven very short, but each giving off a long slender lobe; their insertion is a long way from the front of the clypeus near the eyes, which are somewhat emarginate on their inner edge. *Head, when extended, with its posterior part laid on the apex of the thorax. Mandibles* visible from the front; labrum small but visible between the mandibles; maxillæ and labium placed in a cavity on the under-side of the head, this cavity is very defined by a margin which forms a curve extending between the front angles of the head; the labium is apparently excessively reduced, and I cannot see any mentum or labial palpi; the maxillæ are exposed; their palpi are not very large and are 4-jointed, the basal joint being, however, very minute, the 2nd joint is longer than the 3rd, and the 4th about as long as the 2nd and 3rd together, and oval in form. Thorax much narrowed in front, its anterior opening looking downwards, prosternum separated from the flanks of the pronotum by an obscure suture; front coxæ much exserted, sub-cylindrical, and perpendicular, their cavities widely open behind, but placed at a considerable distance from the front edge of the prosternum. Mesosternum rather large, with a prominence in the middle, which fits between the front coxæ; the middle coxæ separated by a prolongation of the mesosternum, which extends as far as the hind part of the coxæ, and has there a free, slender extremity. Metasternum elongate, its episterna very large, its epimera not visible. Hind coxæ large, but only about half as long as the metasternum. Hind-body slender, of five visible ventral segments, the first of which is about as long as the apical one, the three intermediate being moderately long and about equal to one another. Legs elongate and very slender, the tibiæ without spurs, the tarsi longer than the tibiæ, the front and middle ones 5-jointed, the hind ones 4-jointed. The claws have been covered with gum tragacanth, so that I cannot see their structure.

SOMATIDIA LONGIPES, *n. sp.*

♂. *Sat elongata, fusco griseoque minus læte variegata, elytris versus apicem dilutioribus et plaga communi scutiformi fusca, setis erectis nullis, tuberculis sex minutis, setosis; prothorace sat elongato, anterius minus punctato, punctis vix ad medium extensis.* *Long.* 8 *mm., lat.* 3⅛ *mm.*

The male of this species, though rather similar at first sight to that sex of *Parmena antarctica*, White (Gen. *Somatidia*, Bates), is abundantly distinct; it is larger and especially more elongate, and has the legs much more developed, they are much longer, and the thighs are more clavate, the punctuation of the thorax and elytra is much less, and each elytron has three minute tubercles instead of two. The coloration of the two species seems very similar, except that *S. longipes* will probably prove the less conspicuously variegated.

The discovery of this species is due to Professor Hutton, who recently sent me a single specimen, which was found in Otago.

CRYPTODACNE SYNTHETICA, *n. sp.*

Sub-oblonga, convexa, nitida, subglabra, fusco-ferruginea, elytrorum humeris apiceque ferrugineis, pedibus testaceis, antennis robustis, pilosellis, ferrugineis; prothorace elongato, subquadrato, parcius sat fortiter punctato; elytris parcius subtiliter seriatim punctatis. *Long.* 4¾—5 *mm., lat.* 2 *mm.*

Antennæ robust, about as long as head and thorax, formed as in

Cryptophagus; eyes convex, and with very coarse facets; front part of head much produced beyond insertion of antennæ. Thorax large, not quite so long as broad, the front margin depressed-emarginate on each side beyond the eyes, the sides nearly straight, but slightly narrowed behind, the hind angles well marked and rectangular, the surface with distant but distinct punctures, which bear very short hairs. Scutellum moderately large, impunctate. Elytra with series of fine, distant punctures, which bear excessively short setæ. Legs rather long.

The facies of this species is quite in accordance with its structural characters, for it suggests at a glance a relationship with *Dacne*, *Cryptophagus*, and *Triplax.*

I have received two specimens from Capt. Broun, as No. 4, and am informed that he found about a dozen individuals of the species in fungus, at Tairua. I can see no characters to inform me of the sex of the individuals.

As I have just remarked, this insect combines the characters of *Triplax*, *Dacne*, and *Cryptophagus :* the antennæ are those of a *Cryptophagus*, such as *C. lycoperdi*, the three apical joints, though larger than the preceding ones, can scarcely be called a club: the form of the head and the insertion of the antennæ are as in *Triplax russica*, except that the width is not so great and the length is greater; the facets of the eyes are even coarser than in *Cryptophagus.* The apical joints of the palpi are dilated, that of the maxillary ones being hatchet-shaped. The structure of the prothorax and its relations to the mesothorax are but little different from *Triplax*, the space separating the coxæ is broad, especially in relation to the width of the body ; the prosternal process is not margined at the sides, except in an obsolete manner. The tarsi are all five-jointed, and not flattened, being narrower than in *Triplax*, but not so slender as in *Dacne*, the three basal joints are sub-equal, the 4th, though smaller than the others, is quite distinct, and the 5th joint is large, being as long as the four others together; the structure of the tarsi is in fact just intermediate between *Triplax russica* and *Dacne californica.*

This insect may at present be classed among the *Erotylidæ*, though as it introduces into that family the antennæ of *Cryptophagus*, it tends to complete the union of *Erotylidæ* and *Cryptophagidæ.* The chief characters by which it departs from *Triplax*, are the less clavate antennæ, the very coarsely facetted eyes, and the decidedly pentamerous tarsi.

Thornhill, Dumfries: April, 1878.

FURTHER CONTRIBUTIONS TO THE KNOWLEDGE OF THE *CETONIIDÆ* OF MADAGASCAR.

BY CHARLES O. WATERHOUSE.

The species here described were collected by the Rev. William Deans Cowan, and were forwarded by him to Mr. J. E. Harting, who has placed them at my disposal; the specimens will be found in the British Museum. The collection contained the following species of *Cetoniidæ*, from Fianarantsoa.

Heterosoma collatum, G. & P., ♀; *Heterophana canaliculata*, G. & P., males only; *Stenotarsia discoidalis*, n. sp., ♂ & ♀; *S. Scotti*, Janson, ♂; *Liostraca bella*, n. sp.; *Exixanthis novem-punctata*, G. & P.; *Parachilia melanocala*, Burm.; *Bricoptis variolosa*, G. & P.; *Pygora ornata*, Janson; *P. pulchripes*, n. sp.; *P. Cowani*, n. sp.; *Coptomia prasina*, Burm.; *C. nigriceps*, n. sp.; *C. 4-maculata*, n. sp.; *C. propinqua*, n. sp.; *C. apicalis*, n. sp.; *C. opalina*, G. & P.; *C. sex-maculata*, G. & P.; *Pogonotarsus plumiger*, G. & P.; *Celidota Stephensi*, G. & P.; *Euryomia argentea*, Oliv.

The following are the new species:

STENOTARSIA DISCOIDALIS, *sp. n.*

Atra, depressa, supra opaca; thorace quadrato, limbo fulvo; elytris deplanatis, sat crebre punctatis, regione scutellari maculisque quatuor rotundatis transversim positis atris; corpore subtus longe flavo-griseo-pubescenti; pedibus piceis. *Long.* 6½—7 *lin.*

Clypeus rather thickly and obscurely punctured, only slightly emarginate at the apex. Thorax one-fifth broader than long, rather flat, obliquely but not much narrowed in front of the middle, behind the middle the sides are nearly parallel, the anterior angles are prominent and acute, the posterior angles nearly rectangles but blunt, the base arcuate, black, with all the margins orange-yellow. Scutellum black. Elytra very flat, suddenly deflexed at the sides, at the base much broader than the thorax, regularly narrowed posteriorly, irregularly, distinctly, and moderately thickly punctured, a spot on each side of the scutellum and two round spots on each elytron a little behind the middle, black.

The anterior tibiæ are tridentate in both sexes, but are distinctly narrower in the male. The abdomen of the male is very slightly impressed in the middle, the legs are rather more robust, and the posterior tibiæ have a slight projection on the inner side at a little distance from the apex.

LIOSTRACA BELLA, *sp. n.*

Nigra, deplanata, nitidissima; capite sat crebre evidenter punctulato; thorace longitudine ⅕ latiori, lævi, antice angustato, angulis posticis omnino rotundatis, basi lævissime sinuato; scutello angusto, lævi; elytris thorace parum latioribus, fere lævibus, flavis, circa scutellum apiceque nigris, humeris rufescentibus. Long. 4½ lin.

The thorax is rather broad, narrowed anteriorly, much rounded at the sides posteriorly, the posterior angles very much rounded, the base is broadly but very gently sinuate, nearly straight. The elytra have two or three elongate punctures at the base, and have each two pairs of fine striæ beyond the middle, not reaching to the apex. The scutellar region and the apical third are black, the rest is dark yellow, except the shoulders, which are reddish. The pygidium is transverse, closely and finely strigose. The anterior tibiæ have two sharp teeth.

This species is shorter than *L. bina*, with a broader thorax; the punctures at the base of the elytra are not so long, the impression behind the middle is very slight, and the pairs of fine striæ are shorter.

PYGORA PULCHRIPES, *sp. n.*

Viridis, aureo-micans, nitidissima; singulo elytro striis quatuor, externis parum distinctis; pygidio convexo, parce punctato, utrinque maculâ albâ notato; abdomine albo-maculato; pedibus violaceis. *Long.* 6—7 *lin.*

Head rather thickly and distinctly punctured, clypeus broadly and not deeply emarginate. Thorax a little longer than its width at the base, gently convex, rather sparingly punctured, nearly smooth on the disc, strongly obliquely narrowed in front of the middle, strongly sinuate behind the middle, the base gently arcuate, the margins nowhere incrassate. Scutellum broad at the base, very acuminate at the apex, very obscurely punctulate. Elytra at the shoulders much broader than the thorax, strongly constricted below the shoulders, flat, each with four striæ, the 1st a complete impunctate stria, the 2nd abbreviated and interrupted, the 3rd and 4th more obscure, consisting of a line of punctures. Pygidium rather convex, with a few punctures scattered over the surface (the ♀ with rather more), with a large white spot on each side. Legs violet, femora beneath green.

♂. Anterior tibiæ with two teeth. Abdomen with a mesial impression, clothed with white, having a line of green spots on each side of the impression, and at the sides of the segments.

♀. Anterior tibiæ with three teeth. Abdomen green, with white patches at the sides.

PYGORA COWANI, *sp. n.*

Viridis, aureo-micans, nitidissima; elytris striatis, regione suturali cyaneo; pygidio tri-tuberculato, utrinque albo-maculato; pedibus piceis; abdomine albo-maculato, segmento sexto violaceo, crebre punctato. ♀. *Long.* 7 *lin.*

Differs from the ♀ of the preceding, besides the coloration of the elytra and legs, in being a little broader, each elytron has three nearly complete striæ, and the 4th is short and composed of rather close punctures. The pygidium is strongly transverse, deep blue, with an elongate longitudinal blunt tubercle in the middle, and a smaller transverse one on each side below the white spot. The 6th abdominal segment is thickly striate-punctate below.

COPTOMIA NIGRICEPS, *sp. n.*

Nigra, nitida, lævis; thorace, scutello, elytris, tibiis, tarsisque flavo-piceis, elytris leviter striato-punctatis. Long. 9 lin.

General form and size of *C. mauritiana*, but the clypeus is not quite so deeply notched. The thorax is more regularly narrowed in front, not so angular in front of the middle, there is some very fine punctuation towards the sides with a few rather larger punctures intermixed, the sides are more finely margined. The elytra have five lines of distinct but fine punctures (not reaching the base or apex), the 2nd and 4th interstices are very slightly raised, the 1st and 3rd have each a short irregular line of punctures. The prosternum is as in *C. mauritiana*, but the apex is not bent down. The sides of the sterna are thickly and rather strongly punctured; and the sides of the abdominal segments are distinctly and moderately thickly punctured.

♂. Anterior tibiæ narrow, simple. Abdomen strongly impressed in the middle.

♀. Anterior tibiæ with three sharp teeth.

The pygidium is densely transversely striolate in both sexes, and slightly convex.

COPTOMIA QUADRIMACULATA, *sp. n.*

Olivaceo-viridis, nitida; elytris flavescentibus, suturâ maculisque quatuor olivaceo-viridibus. *Long.* 8½ *lin.*

♂. *Tibiis anticis simplicibus; pygidio fere lævi; abdomine medio impresso.*

♀. *Tibiis anticis tridentatis; pygidio striguloso.*

Closely resembles *C. mauritiana* in form, the thorax is, however, a trifle more narrowed in front, the scutellum narrower, &c. The clypeus is not quite so deeply notched, and the extreme apex is tinged with red. The elytra are yellow, with tinges of green; the suture, a spot on the shoulder, and the subapical callosity, green. The pubescence on the anterior femora is yellowish. The tarsi are more or less pitchy. The pygidium in the male is smooth, not impressed, with a few punctures on each side. In the female it is impressed on each side, leaving an obtuse transverse ridge near the base, and a mesial longitudinal raised line nearly as in *C. mauritiana*; it is finely strigose, but much less densely than in that species, and the mesial raised line is smooth.

COPTOMIA PROPINQUA, *sp. n.*

Olivaceo-viridis (vel purpurascens), nitida; pygidio leviter convexo, subtiliter strigoso; sterno minus producto. ♀. *Long.* 8½ *lin.*

Extremely close to *C. mauritiana*, but at once distinguished from the female of that species by the gently convex, finely strigose pygidium, not impressed at the sides. The form and sculpture are nearly the same, but the thorax has not the larger distinct punctures towards the sides. The elytra have no distinct costæ, and are very smooth; the subapical callosity is closer to the suture, and the extreme apex of the elytra is transversely strigose. The sternal process is less developed, not bent over at the apex towards the anterior coxæ, and anteriorly it is more perpendicular. Tarsi pitchy.

Variety—dark olive-green, nearly black in parts, with the elytra obscure reddish-purple. Legs black. This specimen is a little broader than the other, but I have no doubt as to its identity.

COPTOMIA APICALIS, *sp. n.*

Nigra, nitida; elytrorum apice crebre strigoso; pygidio utrinque oblique impresso, dense subtiliter transversim strigoso. ♀. Long. 10 lin.

This species is very close to *C. propinqua*, but is at once distinguished by the longer clypeus, which is more deeply notched and more distinctly punctured; the apical callosity of the elytra is very acute, and the apex of the elytron below the callosity (from the suture extending a little round the side) is rather closely strigose punctate. The pygidium is rendered opaque by reason of the density of the transverse striation, and there is an oblique shallow but distinct impression on each side. The prosternum is slightly bent over towards the anterior coxæ, but not quite so much as in *C. mauritiana*.

British Museum: *August*, 1878.

Fancy prices for British Insects.—

Merton Hall, Thetford: *August 6th*, 1878.

To the Editors of the Entomologists' Monthly Magazine.

GENTLEMEN,—I enclose a letter which seems to throw some light upon the importation of foreign specimens of rare British insects. I am not in the habit of buying, and certainly not at fancy prices, but if collectors are to be found who will give anything approaching to the prices named in this letter, they put a high premium upon unscrupulous deception. I cast no imputation whatever upon the fortunate possessor of 41 specimens of *Pachnobia alpina*. If he can get £20 for the best of them he will be right to do so, but the investment does not recommend itself to a mere student, who seeks to learn the innumerable forms under which the creations of nature are to be distinguished and separated with precision.—I am, yours faithfully, WALSINGHAM.

The following is a copy of the letter referred to:—

——— begs to inform Lord Walsingham that he has 41 fine specimens of *Pachnobia alpina*, most of them as good as bred. The prices range from £6 to £20. If his lordship would like to see them, ——— will forward them by post, with the prices attached. There are marvellous varieties of this fine moth, and no two are alike.—*July 31st*, 1878.

[We have great pleasure in publishing the above letter from Lord Walsingham, and a copy of that received by him, omitting name. The question of *price* (as he suggests) rests between buyer and seller. There is no standard regulating the prices of "British" insects; and if there are those willing to pay any sum asked, we do not see how it is possible to prevent the sellers from receiving it. Continental dealers (all over Europe) have, through competition, arrived at a general system of prices, varying very little individually, so far as can be judged from the lists we receive. The intrinsic value of a "British" insect should be about on a par with that of a continental specimen of the same species, varying slightly either way, on account of rarity, &c., or otherwise. From a scientific point of view it is to be regretted that insects are sold as "British" that are not of native origin; but the mischief is mainly caused by the buyers. So long as there are British idiots willing to pay fancy prices for "British" insects, it is quite certain the supply will be equal to the demand. In the particular case in question we have no reason to suspect any *fraud,—quite the contrary.*—EDS.]

Spercheus emarginatus in Essex.—My friend, Mr. T. R. Billups, recently brought me a beetle to name, of which species he had found four examples—by a mere accident —floating on the surface of the water in a ditch adjoining some marsh-ground at West Ham, Essex.

This beetle proved to be *Spercheus emarginatus*, which species, as far as I am aware, has not been captured in this country for many years; the retired habits of this insect, living, as it does, at the roots of aquatic plants, has, doubtless, caused it to be overlooked, and led Coleopterists in Britain to suppose it had become extinct; consequently, its occurrence here, so near London, is especially interesting.

In company with Mr. Billups (who kindly guided me to the place) I subsequently visited the locality, and here, in a long narrow ditch without any visible outlet, by the diligent use of the water net amongst some floating aquatic plants, washed out by the roots by a recent flood, we succeeded in capturing many examples of the species.—GEO. C. CHAMPION, 274, Walworth Road, London, S.E.: *August* 13*th*, 1878.

Harpalus quadripunctatus in Ireland.—I found a single specimen of the hill-frequenting *Harpalus quadripunctatus*, Dej., last June, on the summit of the "Sugar Loaf" Mountain, near Bray, Co. Wicklow; it was the only local species met with by me during six days' sojourn in that neighbourhood.—ID.

Change of nomenclature in Coleoptera.—In the Rev. Mag. Zool. (3), iii, p. 41, I described a genus of *Scarabæidæ*, from Australia, under the name *Neocnemis*; as this name was used by Mr. Crotch in 1867 for a genus of *Coleoptera*, it is necessary that the name I gave should be replaced by another, and I propose, therefore, to use *Neocnecus* for the Australian genus.—D. SHARP, Thornhill, Dumfriesshire: *August*, 1878.

Capture of Acidalia ochrata.—You will be pleased to hear that this species has turned up in its old haunts on the south-east coast, after a lapse of nearly twenty years. I found it tolerably common; several females laid eggs, which hatched in due course: of these you will probably hear more at a future time.—E. G. MEEK, 56, Brompton Road, S.W.: *August 2nd*, 1878.

Tineina observed at the Scilly Isles, July 12*th to August* 13*th*, 1877.—Mr. F. J. H. Jenkinson has sent me a list of his *Tineina* observed at Scilly last summer, from which I have made the following extracts:—

"*Tinea ferruginella.*

"*T.* ———, allied to *argentimaculella*, occurred round the house, *one* was taken *in*-doors. [This differs from *argentimaculella* in the fasciæ being broader, less defined and less silvery—the apical markings are *two only*, viz.: a costal drop and a spot beneath it; the cilia are whitish at the base in certain lights, *the tips are distinctly whitish.*—H. T. S.].

"*Gelechia diffinis*, very bright with rosy tinge.

"*G. desertella.*

"*G. mundella.*

"*G. umbrosella.*

"*G. ocellatella*, the larva living in a gallery along a flower head, usually causes *a twist or pucker in its growth*, first bred August 16th.

"*Cleodora cytisella*, rather common, flying among ferns as usual.

"*Œcophora quadripuncta*, rather common, beaten from overhanging tufts (*Statice*, &c.), on a bank by a village.

"*Argyresthia Gœdartella*, the rich golden varieties the commonest.

"*Gracilaria tringipennella*, July 30th.

"*Elachista*. [A rather imperfect specimen, but which certainly seems to me to indicate some species as yet unknown to us.—H. T. S.].

"*Chrysocorys festaliella*, not only on Tresco, but on Tear, a rather small northern island, but, from its hilly nature, capable of giving shelter."—H. T. STAINTON, Mountsfield, Lewisham: *July 12th*, 1878.

Habits of Gelechia gerronella, Z.—This insect had become proverbial for being in poor and wasted condition, and it had, besides, a bad habit of occurring only singly: judge, therefore, of my surprise when, on the 13th July, 1878, I dislodged from a furze-bush, on the Common at Tunbridge Wells, a *fine* specimen of *Gelechia gerronella*; it was quite a startling apparition! A week later I captured more than twenty specimens in a single evening; they were flying at dusk amongst the furze-bushes between 7.45 and 8.30 p.m.; about a third of them were in very decent condition. The insect continued to occur up to the end of July, after which date the specimens were too wasted to be worth setting.

Mr. Machin had, however, been beforehand with me in taking *fine* specimens of *G. gerronella*, and had actually bred the insect, without, however, having made the acquaintance of the larva. His experience of the species was as follows:

Early in June, he cut from the furze-bushes, at Wanstead, a number of the webs of the larvæ of *Butalis grandipennis*; the insects began to emerge about the 20th June, and continued to come out till about the 10th or 12th of July. Amongst the large number of *B. grandipennis* which he reared, two specimens of *Gelechia gerronella* made their appearance. On seeing these, he went, at the end of June, to the place where he had collected the larva, and beat from the furze-bushes *ten very good* specimens of *G. gerronella*.—ID.: *August 13th*, 1878.

Notes on Tineina bred in 1877 *and* 1878.—The larvæ of *Gelechia viscariella* were very abundant in the tops of a *Lychnis* at Wyre, and in various localities near Preston, during May, 1877; but this year they are almost entirely absent; in this following the example of their food-plant, which is very scarce where last year it abounded. The perfect insects emerged in limited numbers during July, being very much infested with ichneumons.

On May 13th, 1877, I collected roots of sea plantain on the banks of the river Wyre, for larvæ of *Gelechia instabilella*, which mine in the roots, and, as far as present observation goes, not in the leaf or stem. From these emerged about a dozen imagos of *G. instabilella* in July, and, to my surprise, on June 30th, one specimen of a little black *Gelechia*, unknown to me, which Mr. Stainton pronounces to be probably *immaculatella*. Larvæ found mining in the leaves of *Aster tripolium*, and supposed to be also *instabilella*, produced *ocellatella*; thus giving another food-plant, and even manner of feeding, to this insect.

On the cliffs at Morecombe, where *Genista tinctoria* grows, larvæ of *Anarsia genistæ were feeding in the shoots*; but this insect appears so like the common form, *A. spartiella*, that I am inclined to refer the difference in size and colour to the more succulent properties of the food-plant, just as *Depressaria costosa* is more deeply marked with reddish under the same conditions. It is, however, worthy of note that *genistæ* was feeding, June 8th; *spartiella*, July 5th. The larvæ were not compared in any way, nor indeed examined with the care due to them.

On the same day, at the same place, *Plutella annulatella*, in the larval state, was common on *Cochlearia anglica;* they emerged in the middle of July.

At the latter end of May, whilst collecting larvæ of *Coleophoræ* on the willows at Farrington, my attention was directed to the twisted condition of the shoots of *Lotus corniculatus* on the railway bank close by. Thinking this was owing to larvæ of *Sciaphilæ*, I neglected to gather many at the time, but afterwards, looking in the tin in which they were placed, I perceived a *Gelechia* larva, belonging to the *tæniolella* group, but darker in colour. In the latter end of June one imago of a *Gelechia* unknown to me appeared above the rubbish, and, on reference to Mr. Stainton, he pronounced it to be probably *cincticulella*, a species which feeds on the continent on *Genista*, but had not previously occurred in this country. I visited the locality this year, but only obtained one larva, which unfortunately died.

Larvæ of *Coleophora Wilkinsoni* begin to feed on birch at Witherslack about the beginning of July, and continue to do so, at intervals only, until September, when they hibernate full fed, and, if brought into the house early in the spring, will walk about as if seeking for food. This, however, they refuse, but change into pupæ, and emerge about the end of June. They are probably two-year feeders, as full-fed larvæ are to be seen whilst the moth is flying. They are thus very similar in habit to *limosipennella*, which, with us, never emerges in autumn, but feeds on through the summer, hibernates, and emerges a little later in the year than *Wilkinsoni*. It also feeds on birch.

After very patient and repeated search, at length larvæ of *Depressaria capreolella* were discovered feeding on leaves of *Pimpinella saxifraga*, not on the radical leaves, however, but on the higher shoots. They are deep green with black heads, and, through the plant being buried amongst larger herbage, are very difficult to find. A few perfect insects emerged early in August. The larvæ feed during July.

In July, 1877 and 1878, I had the pleasure of finding cones of *Gracilaria populetorum* on birch. At the former date one insect was bred from a miscellaneous collection of buds, mined leaves, &c., but this year, by observing the different modes of feeding adopted by the larvæ on the birches, I succeeded in taking about three dozen cones, which occupy an entire leaf, and inside which a green, semi-transparent larva was feeding. These changed to very long, taper, light green pupæ, from which emerged, in all, only five imagos, and about twenty large ichneumons. This accounts for the comparative rarity of the insect.

Some years ago, Mr. Hodgkinson bred a few *Asychna profugella* from seeds of gentian, and, as he had afterwards failed in another attempt, I tried, in addition, other seeds, such as *Pimpinella saxifraga*, wild carrot, &c. On the 29th September these were placed in a flower pot and exposed all the winter, when, to my great satisfaction, between July 1st and 30th, about two dozen imagos appeared, in company with *Semasia rufillana*, *Œ. flavimaculella*, and the pug, *Eupithecia denotata*.—*J. H. Threlfall, 4, East Cliff*, Preston: *August* 14th, 1878.

Description of the larva of Miana furuncula.—For the discovery of the larva of this insect we are indebted to Mr. J. Gardner, of Hartlepool. During the first week in May last, he found a number of *Miana* larvæ feeding on *Aira cæspitosa*, which he at once suspected belonged to *furuncula*. Seven or eight of them he forwarded to me, and on seeing them I had little doubt as to the correctness of his suspicion. This proved correct, as, although I was unsuccessful in getting a moth from my larvæ, on the 19th July, Mr. Gardner was fortunate enough to breed the species from those he had retained for himself.

Length, about three-quarters of an inch, and of the usual *Miana* shape: head small, and very much narrower than the second segment; it is brightly polished, has the lobes rounded, but is pointed at the mouth. Body cylindrical, attenuated towards both extremities from the fourth segment, which is the widest: there is a polished plate on the front of the second, and another on the anal segment: skin smooth, but tough and rather glossy, which gives the larva a mealworm-like appearance.

The ground is a very pale straw colour, in some specimens strongly tinged with purple; head brown, the mouth still darker brown; the pale yellow pulsating alimentary canal forms the dorsal line; there are no perceptible sub-dorsal or spiracular lines; the plates on second and anal segments are a paler shade of brown than the head: spiracles large and round, intensely black. The only other marking is a faint purplish marbling in the centre of each segment, on each side of the dorsal line. Ventral surface and pro-legs uniformly of the ground of the dorsal area; the legs brown.

The cocoon is made inside the larger sheaths of the stem, near the root, and is rather strongly formed of little bits of the drier grass bitten out and cemented together.

The only *Miana* larva now undescribed is *expolita*, and I hope this may be settled next year, as Mr. Gardner, after a great deal of trouble, has supplied me with eggs of this species also: these hatched about ten days ago, and I hope the young larvæ aregoing on well.—Geo. T. Porritt, Highroyd House, Huddersfield: *Aug. 10th*, 1878.

Chrysopa tenella, Schneider.—Hagen, in his "Synopsis of the British Planipennes," published in the Entomologists' Annual for 1858, included this species in the British List with doubt, on the authority of a single example in the British Museum. I omitted it in my "Monograph of the British *Neuroptera-Planipennia*" (Trans. Ent. Soc. Lond., 1868), but introduced it in the Catalogue of British *Neuroptera*, published by the Entomological Society in 1870, on the authority of a specimen taken by Mr. Wormald at Hampstead. It has since been found by me several times, and the indications of localities and dates are as follows:—Weybridge, 4th July, 1874; Tunbridge Wells, 28th July, 1874; Darenth Wood, 3rd June, 1878; Weybridge, 17th June, 1878; Southborough, near Tunbridge Wells, 30th July, 1878. (One example from near Plymouth, end of August, 1877, is doubtful). On one occasion I found two examples on the same day, but otherwise it has only occurred singly. Schneider originally described it from a single example captured by him in the botanical garden at Breslau and I should say it is always scarce, judging from the paucity of examples from the Continent seen by me. It is a delicate little species, and the pale yellow (or whitish) dorsal vitta in living specimens gives it a resemblance to *C. vulgaris*, from which it can at once be separated by the form of the third cubital cellule, and the partially black neuration, &c. It is apparently inodorous.—R. McLachlan, Lewisham: *2nd August*, 1878.

Potamanthus luteus at Weybridge.—On the 6th of last month (July), I captured a large ♀ imago of this Ephemeron close to the mouth of the Wey. With the exception of a ♂ in my collection, a very old specimen obtained by me years ago (from a source I cannot now trace), the species has been only known as British by a sub-imago described by Curtis, in 1834, as *Baëtis mellea*, for which he gave no locality. A recent capture (with a definite locality) is worthy of record.—Id.

Cordulia Curtisi in Hampshire.—On the 1st July last, I caught six specimens (2 ♂, 4 ♀) of this handsome species on a heath lying to the north of Pokesdown, near Christchurch, Hants. As I understand from Mr. McLachlan that he is not aware of any specimens of this local species having been caught in this country for many years, my captures may, possibly, be considered worth recording.—H. Goss, Surbiton Hill: *17th August*, 1878.

[This insect (now known as *Oxygastra Curtisi*) used to be taken not uncommonly in the New Forest District by the late Messrs. Dale and Curtis. Probably it may have been found continuously since, but I know of no recent records of its capture. On the Continent, it has been found in France up to as far north as Le Mans (lat. 48°), but is essentially southern and western, occurring only in the south of England, southern and western France, and in Spain and Portugal.—R. McLachlan].

Note on Trioza galii.—The sallow-pit at Lee, which, during the last thirty years, has afforded more rare species of *Lepidoptera*, *Coleoptera*, and *Hemiptera* than any other place of the same small extent in the kingdom, still exists, in spite of the near approach of houses, and its productions are not yet exhausted. On the 1st inst., from *Galium uliginosum*, which grows sparingly among the sallow-bushes, and also in the open part among the rushes,* I beat some twenty examples of the hitherto scarce *Trioza galii* into an umbrella, where they walked leisurely about, as though the domain were their own, not jumping except on persuasion; yet, on the other hand, one individual of a more venturesome or restless disposition flew down among his quieter relations. Even on the dark-coloured umbrella these black creatures, looking very like *Aphides*, were rendered conspicuous by their lustre, and by the snow-white band and spot on the abdomen. These latter are mentioned only by Flor, not by Foerster, the original describer, nor by others; and supposing the latter had to deal only with dry insects it may have been that in the process of drying the white markings were retracted under the preceding segments and thus became invisible.† Yet it should be remembered that Foerster had taken the species himself, and must, therefore, have seen the white markings noticed by Flor, which show through the closed wings, if they existed on his examples; further, that Foerster's species was found on *Galium verum*, which grows only in dry places, while Flor's species was common in wet meadows (food-plant not mentioned, but probably *Galium uliginosum* as recorded by Dr. Reuter). It does not, therefore, seem clear that Foerster's and Flor's species are the same. It has been surmised that the rare *T. velutina* is only a form of *T. galii*; they being confessedly very similar, but there is a discrepancy between the descriptions of the species by Foerster and Flor, like those of *T. galii* by these authors; that is, that Flor mentions conspicuous white markings on the abdomen, which are not noticed by Foerster, although he took the species himself. Provided that the difference is not accounted for by shrinking in the process of drying, as hinted above, there may here be two species instead of one, but as the food-plant is unknown, it is scarcely possible to get enough examples to settle this question or that of the identity of *velutina* and *galii*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham; *August 9th*, 1878.

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* *Galium palustre* also straggles up among the herbage under the bushes, and I am not sure that some of my captures did not come from it.

† *Flor considers that these markings* are of the nature of a secretion, but does not say they are *evanescent: they are always regular in form.*

The Microphone in Entomological research.—There can be little doubt but that the microphone will reveal much that is novel and interesting as regards the voices of insects. But I can scarcely agree with Mr. S. D. Bairstow's suggestion (*ante*, p. 43), that the spell by which male moths, such as *Saturnia carpini*, are attracted to the female can be a sound. There are cases on record where male moths have come eagerly to the empty cocoon or chrysalis from which a female had escaped, or even to some object upon which she had recently settled. (See Zoological Journal, v, p. 142).—J. W. SLATER, 3, Bicester Road, Aylesbury: *August 3rd*, 1878.

Reviews.

THE FAUNA OF SCOTLAND, with especial reference to Clydesdale and the Western District. HYMENOPTERA, Part i, by PETER CAMERON, 8vo, pp. 52. Published by the Natural History Society of Glasgow, at their rooms in Anderson's College. May, 1878.

This is the first of a series of publications in which it is proposed to give Catalogues of the Scottish Fauna. A strong list of contributors in various branches is given as proof of the desire exhibited by the Society to make the work as complete as possible, and co-operation is earnestly invited from outsiders. This is evidently needed, and in Entomology especially, for some of the larger Orders of Insects are yet unallotted.

Mr. Cameron, who has engaged to Catalogue all the Scottish *Hymenoptera* (and some other more obscure groups), naturally commences with the *Tenthredinidæ*, and notices 209 species, as against 360 found in Sweden, and 268 in France; but this latter numerical comparison is based upon very incomplete information.

Mr. Cameron evidently aims at making his portion of the work something more than a mere Catalogue. There is a long Introduction, with numerous very suggestive remarks upon distribution, nomenclature, &c., and most valuable notes on particular species, with descriptions of a few that are considered to be new. The table of comparative geographical distribution of the "Sub-tribes" is perhaps too extended, and liable to mislead, being, for the most part, based more upon negative than positive evidence, and there is one conspicuous omission, inasmuch as no comparison is made with the *English* Fauna.* In endeavouring to make such a necessary comparison we have been struck with the preponderence of species of *Nematus* and the paucity of representatives in *Hylotoma*, &c., in Scotland. Some *Hylotomæ* that we in the south of England are disposed to consider "common objects" are apparently wanting across the border.

We regard this Catalogue as a good prelude to the work on British Saw-flies that Mr. Cameron is known to have in preparation for publication by the Ray Society. That it is occasionally marred by literary defects is to be regretted, such, for instance, as is shown in the note on *Eriocampa adumbrata* (p. 24), any attempt to translate which would, we think, drive an intelligent foreigner to the verge of distraction.

SYNOPSIS DES HÉMIPTÈRES-HÉTÉROPTÈRES DE FRANCE. 1er Partie, Lygæides. Deyrolle, Paris.

The above is the title of an excellent monograph just published by the well known French Hemipterist, Dr. Puton. It is hardly necessary to say that the work is well done. All the species indigenous to France are described in it, and the genera and species are also worked out, showing their distinctive characters in very clear synoptical tables. After each species are given localities and the food-plant of the insect when known. About 157 species are described, making about three-fifths of the total number of European species, as given in Dr. Puton's last Catalogue.

The work will be of the greatest value to those who wish to distinguish the closely allied species of this family.—E. S.

Obituary.

Carl Stål. As already noted (p. 72, *ante*), entomological science has sustained a great and irreparable loss, the distinguished Swedish Hemipterist, Carl Stål, having died after a short illness on the 13th June last, at Frösundavik, near Stockholm, at the age of only 45 years.

He was born on 21st March, 1833, at the Castle of Carlberg, where his father, Colonel Stål, was then stationed; was a student at the University at Upsala in 1853; passed the medico-philosophical examination in 1857, and then for some time studied anatomy and physiology at Stockholm. After a journey abroad he became, in 1859, Assistant to Professor Boheman in the Entomological Section of the National Zoological Museum, and, after the death of Professor Boheman in 1867, he was appointed by the Academy of Sciences Superintendent of the Section with the title of Professor. He had previously taken the degree of Doctor in Philosophy at Jena.

Both before and after his nomination he contributed by scientific excursions in his native country to the knowlege of its insect-fauna, having for this purpose visited the island Gottland in 1849 and 1863, the provinces Skåne, in 1853, and Ångermanland, in 1858. By many journeys to Germany, France, Denmark, and also to England (1862), and by studies at the museums abroad, he further extended his knowledge in entomology, and his "Hemiptera Fabriciana," vols. i and ii (K. Vet. Akad. Handl.,

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* *To a foreigner such an omission* must prove especially puzzling. He will be apt to take it *for granted that such genera as Schizocera, Harpiphorus*, &c., do not occur in England.

1868—69), so important for the study of the Fabrician species of *Hemiptera,* founded on his examination of the Fabrician types at Kiel, bears testimony to his talent and assiduity.

Being charged to work out certain parts of the collections made in Caffraria by the celebrated traveller, P. A. Wahlberg, Stål was obliged to devote extensive study to Orders of Insects which till then were the most neglected and unelucidated, namely, the *Hemiptera* and *Orthoptera*: a part of the result is embodied in his "Hemiptera Africana," i—iv, Stockholm, 1864—66. He here gave special attention to the systematic classification of these insects, and every one who has been occupied therewith knows how difficult it is to find a clue to this, and can therefore appreciate the extreme merits of Stål in this result of enormous diligent work, and his special talent for such studies. Systematic Natural History is by no means easy; it requires a sharp eye for the essential characters significant of natural affinity, and this power of insight, which sometimes must be well nigh inspired, Stål had in the highest degree. If one only considers the enormous and almost untreated materials he has put in order, he may further observe the value of the principles he has followed, and which are now generally adopted, and cannot estimate his energy and ability too highly.

Most of the works of Stål are of a systematic character. His greatest and most significant is his "Enumeratio Hemipterorum," vols. i—v (in K. Vet. Akad. Handl., 1870—76), in which he has put together the results of all his former investigations which had been published in a multitude of papers, partly in the Öfversigt af K. Vet. Akad, Förhandl., and the Bihang till K. Vet. Akad. Handl., and partly in many foreign entomological journals. In his "Enumeratio" he became convinced of the impossibility of dealing systematically with all the *Hemiptera* of the world, at least at one time, and he has therefore treated them with respect to the great zoological regions. By this work he has erected for himself a lasting monument.

He also worked out for the European fauna some systematic sketches of great worth, namely, the "Revisio Pentatomidarum, Coreidarum, Lygæidarum, Reduviidarum et Tingitidarum Europæ," in the Öfversigt K. Vet. Akad. Förhandl., in which is to be admired how, in a brief manner, he laid down a multitude of important characters, which had escaped the attention of others, and on which he has founded an arrangement of families and genera of which the naturalness is indeed striking.

He also devoted similar energy and ability to the *Orthoptera,* resulting in the "Recensio Orthopterorum," i—iii (1873—76)—a valuable communication concerning the systematic classification of these insects.

Among his other greater works we must especially mention the "Bidrag till Rio Janeiro traktens Hemipterfauna," i, ii (in K. Vet. Ak. Handl., 1860—62), and his "Monographie des Chrysomélides de l'Amerique," i—iii (in Nova Acta Regia Societatis Scientiarum Upsalensis, 1862—65). His smaller works we must pass by.

Stål is, without doubt, regarded by all entomologists as the most distinguished Hemipterologist of the present time, not only for the extent but for the solidity of his labours; and the museum of which he was the chief has now certainly the greatest collection of *Hemiptera* in the world.

In private life, Stål was very considerate and obliging; to manners quite *without pretension, he* united a warm heart, he was constant in friendship, and, in fine, was a man of valuable and noble character; all which qualities make the regret of those who had the delight of his personal acquaintance the deeper for their loss.—O. M. R.

ENTOMOLOGICAL SOCIETY OF LONDON: *3rd July*, 1878.—H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

Mr. B. S. Nevinson was elected a Member, and Mr. J. A. Finzi a Subscriber.

Mr. Pascoe exhibited a selection from his captures on a recent expedition to Algeria and the South of Spain; including *Scorpio funestus, Tarisa dimiditiapes, Anthocharis Nonna, Typhlopone oravensis*, &c., &c.

Mr. W. C. Boyd stated that, according to his experience, the grass in which the larva of *Elachista cerusella* mines is *Phalaris arundinacea* and not *Arundo phragmites*, as is generally believed, and considered the mistake was due to the difficulty of separating these plants when only in leaf. But Mr. Stainton and others thought it was still an open question as to whether the species might not be also attached to the *Arundo*. (We shall be glad to learn the experiences of other breeders of *Micro-Lepidoptera* on this point.—EDS.)

Mr. Distant exhibited a species of *Homoptera* from New Zealand, sent to Dr. Sharp by Mr. Lawson, and which he identified as *Ricania australis*, but it was darker than Australian specimens of the same species; it had been found on the Dahlia in New Zealand.

Professor Westwood called attention to an article by Dr. Packard in the "American Naturalist," for June, 1878 (vol. xii, p. 379—383) on "The mode of extrication of silk-worm moths from their cocoons" by means of a tooth at the extreme base of the anterior-wings, and considered by the writer (who referred especially to *Attacus luna*) to be a new discovery. He pointed out that the fact was not new but had been long ago observed by Captain Hutton with regard to *Attacus Selene* in India, and published in vol. v. of the 1st series (p. 85) of the Society's "Transactions."

Professor Westwood also alluded to a Lepidopterous larva injurious to potatoes by boring in the stems, and considered by him to belong to the *Pyralidæ*.

Mr. Jenner Weir exhibited examples of *Leucania turca* from the New Forest, to the haustella of which pollen-masses of *Habenaria bifolia* were attached. Also a singular aberration of *Hipparchia Hyperanthus*, in which the eye-spots on the underside of the wings were oval instead of round.

Mr. Dunning exhibited living examples of the spider *Thomisus citreus*, sent to him by Mr. Nottidge, of Ashford, as a good instance of mimicry, the white colour serving a purpose useful to the spider (a hunter, and not a spinner) by concealing its presence in the flowers it frequents.

Sir S. S. Saunders communicated notes sent to him by Mr. J. Haselden, from Egypt, relating to the habits of a honey-bee (probably *Apis fasciata*), in which he had observed several females and attendant "swarms" issue from the same hive at short intervals.

Mr. C. O. Waterhouse read a paper on New *Coleoptera* from Australia and Tasmania in the collections of the British Museum.

NOTES ON LEAF GALLS ON *PARINARIUM CURATELLIFOLIUM.*

BY E. A. ORMEROD, F.M.S.

The accompanying figures represent two kinds of leaf-galls on *Parinarium curatellifolium* of Central and West Africa, which, though unaccompanied by specimens of the gall-makers, may be of some interest from their complicated structure.

The trees of this genus (perhaps best known in the species called the gray plum of Sierra Leone) belong to a sub-division of the *Rosaceæ*, occurring for the most part in the tropical regions of America and Africa; and the African specimens which I have had an opportunity of examining in the Herbarium of the Royal Gardens at Kew shew a considerable variety in the nature of the galls, which are formed for the most part on the leaves, but in some cases on the stem, or the pedicels of the inflorescence. Of the leaf-forms, one bears much resemblance to the *Phytoptus* nail-gall of the lime tree (*Tilia intermedia* and *T. grandifolia*), though differing in some points of structure.

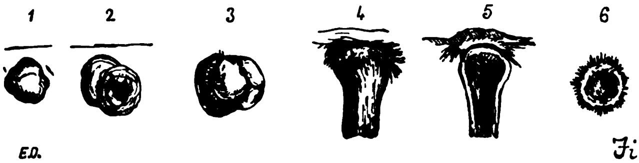

Fig. 1

Another causes a swelling of the leaf-surface about an eighth of an inch or more in horizontal diameter, glabrous on the upper side of the leaf, and mealy below, corresponding with the remarkable mealiness or roughness of the under surface of the leaves. Internally, these galls are spongy and sometimes two- or more-chambered, and, in this case, a few specimens of *Chalcididæ* were still present, but too brittle, from lapse of time, to bear removal for identification. A third species is almost similar in size and general appearance to our own *Neuroterus lenticularis* gall, the common oak-spangle. This species shows, when magnified, a central disc surrounded by a well-defined ring, the whole being covered with orange-yellow pubescence, and the insect-chamber remarkable, in the specimens I examined, for extending as a horizontal slit of an equal width throughout, across the whole breadth of the central disc.

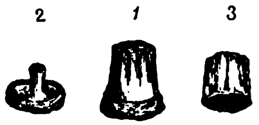

Fig 2

A fourth species appears as a mass of upright orange-yellow hairs, somewhat drawn to a blunt point (not unlike the lower half of a camel's hair pencil cut off and set up on end), but in this case I had no opportunity of examining the nature of the central gall-mass.

One, or possibly two, other woody knob-like forms were noticeable on the twigs and the pedicels, but the most unusual forms were those of the leaf galls given in figs. 1 and 2.

Of these, fig. 1 shows a form occurring on the under surface of the leaves of *Parinarium curatellifolium*, of which the progress of development may be traced from the commencement.

Here the first stage consists simply of a blister-like swelling shown at (1). This is followed by the appearance of the future gall, pressing forwards as a minute, fleshy, lobed ring, of a deep reddish colour (2) through the first grey blister-like swelling, the growth of the red gall and its grey basal involucre continuing until the former, through the stage of a lobed bud-shaped mass (3), gradually lengthens into a flask-shaped gall (4), about three sixteenths of an inch in length. Internally, this gall is single-chambered and smooth, closed at the mouth of the tube by a thick mass of downy yellowish hairs, and another mass of straight and centrally-pointing hairs is placed at the bottom of the chamber (5). The gall, in its fully developed condition, is of a deep red colour, and hangs from the leaf like a miniature acorn in its cup, for the growth of the blister-like swelling through which it sprung keeps pace with it, and now forms a pubescent socket distinct in colour and structure from the gall itself, from which it is ultimately freed by the fall of the gall to the ground, whilst the socket remains permanently attached to the leaf (6).

In the leaf-gall given at fig. 2, which, like the previous one, is on *Parinarium curatellifolium*, and magnified to about four times its natural size, the growth is still more peculiar. Here the appearance of the gall when complete resembles a miniature tumbler-glass inverted and set in a ring. At maturity, the two parts separate, or are separable, the cap falling off and leaving (as shown at 2) the base formed of a ring enclosing a concave disc, with flutings from the circumference to the centre, which rises in an upright cylinder, of a width of about a quarter of that of the gall, and a length of somewhat more than twice its own diameter. The fallen cap is merely a truncated cone, flat or slightly concave at the top, and slightly fluted vertically downwards from the summit for about half the length. The hollow central cylinder is presumably the gall-chamber; but insect presence was so totally non-existent in the few specimens attainable for examination, *that I cannot hazard a* conjecture as to the gall-maker. It would be of much interest to discover from fresh specimens what parasitical or other exigencies the very peculiar and apparently defensive structure is intended to serve.

In the case of the flask-shaped gall (fig. 1), there was also no clue by determinable insect-presence to the gall-former; but in all probability it belonged to one of the *Psyllidæ*.

Spring Grove, Isleworth:
September, 1878.

NOTES ON AFRICAN *HEMIPTERA-HETEROPTERA*.

BY W. L. DISTANT.

SCUTATA.

Genus *ASPONGOPUS*, Lap.

Aspongopus intermedius, *n. sp.*

Greenish-black, corium and membrane dull purplish. Pronotum and scutellum thickly and coarsely punctured, the scutellum transversely rugulose, corium thickly and finely punctured. Pronotum with the lateral edges broadly reflexed and luteous above and below, border of corium, at base only, of the same colour on both sides. Antennæ black, 2nd and 3rd joints sub-equal, 4th somewhat incrassated and sulcated, a little shorter than apical joint, which is the longest, and clothed with pale pubescence. Rostrum piceous, 1st joint sulcated, 2nd joint the longest. Abdomen above pale olivaceous, with a marginal segmental row of alternate quadrate black and luteous spots. Under-side shining dark olivaceous, very thickly and finely punctured, with a marginal row of quadrate luteous spots occupying the centre of the outer edges of the segments. Femora and tibiæ strongly sulcated.

♀. Long. 17 mm.

Madagascar (Crossley).

This species is allied to *A. flavo-marginatus*, Sign., and *A. rotundatus*, Sign., its place being between the two. It differs from the first by its very much smaller size, the very strongly reflexed and rounded lateral edges of the pronotum (sinuated somewhat in *flavo-marginatus*), and in the luteous costal border of the corium being confined to the base only. From *A. rotundatus* it is distinguished by its very much larger size, and Stål, who seems to have examined the species, thus writes (Hem. Afr., i, p. 217), "articulo secundo antennarum tertio subbreviore," and, in comparison with *A. flavo-marginatus*, the pronotum is "marginibus lateralibus multo minus late flavescentibus." The *general colour also* seems to be different.

ASPONGOPUS FARLEYI, *n. sp.*

Castaneous, with obscure green reflexions, thickly and coarsely punctured. Antennæ black, 1st and 3rd joints sub-equal, shorter than 2nd, 4th longest, incrassated, obsoletely sulcated, apical joint somewhat shorter than preceding, narrowly fuscous at tip. Head emarginate at apex, sides sinuated. Rostrum piceous, apical joint paler. Base of pronotum and scutellum somewhat rugulose. The green reflexions are principally observable at base of pronotum, apex of scutellum, and apical half of corium. Membrane castaneous. Abdomen above rufous.

Long. 17 mm.

North Nyassa (Farley).

This species is allied to *A. viduatus*, Fab., from which it is structurally distinguished by the length of the 2nd joint of the antennæ, and the strongly incrassated and sulcated appearance of the 4th joint. The colour of the abdomen above, and absence of the black frontal markings of the pronotum, also prevent confusion.

REDUVIIDÆ.

Genus *PLATYMERIS*, Lap.

PLATYMERIS CONFUSA, *n. sp.*

Black, a large sub-quadrate spot about centre of corium, and femora near apices banded with luteous. Pronotum with frontal lobe armed with a short spine on each side, and deeply excavated and furrowed. Posterior lobe with the disc elevated, on which is a faint central longitudinal impression, and the lateral angles produced into acute spines directed backwards. Antennæ, with the exception of the basal joints, obscure castaneous, pilose. Legs pilose, the femoral luteous bands broadest on fore femora, and narrowest on the posterior. Abdomen above rufous, with the sides and apex black. Membrane somewhat paler, and obscure fuscous.

♀. Long. 41 mm.

Nyassa.

This species is allied to *P. Rhadamanthus*, Gerst., from which it is separated by the armature of the anterior lobe of the pronotum. The three allied East African species can be thus identified :

A. Lateral angles of posterior lobe of pronotum produced into acute spines.
  a. Anterior lobe of pronotum unarmed .... *Rhadamanthus*, Gerst.
  b. Anterior lobe of pronotum with spine on each side.....*confusa*, Dist.
B. Lateral angles of posterior lobe of pronotum rounded.
  c. Anterior lobe of pronotum with spine on each side.....*guttatipennis*, Stål.

I have lately received from the northern end of Lake Nyassa five specimens (♂ & ♀) of *Platymeris Rhadamanthus*, Gerst. They differ from the figure of that species in the "Reise in Ost-Afrika" in having the spot on the corium, as well as the femoral markings, rufous. They are also rather larger in size.

Derwent Grove, East Dulwich :
July 13th, 1878.

DESCRIPTIONS OF NEW SPECIES OF *ERYCINIDÆ.*

BY HERBERT DRUCE, F.L.S.

ABISARA ROGERSI, *n. sp.*

Allied to *A. Gerontes*, but differs as follows: the ground colour of the wings much paler brown, the white band on the anterior-wing broader and straighter, between it and the apex a second narrow white band, indistinct near the inner margin, the black spot near the apex wanting. Posterior-wing: the white band much broader, and extending almost to the outer margin, and only separated from the white tail by a narrow brown line. On the under-side all the brown markings are very indistinct, almost white. Exp., 1⅛ inch.

Hab.: Angola (H. Rogers). Mus. Druce.

MESOSEMIA THYESTES, *n. sp.*

Allied to *M. Jeziela*, differing as follows: the white band of the anterior-wing very broad, bordered inwardly with light blue, not reaching the costal margin, but only to the end of the cell. Posterior-wing the same as *M. Jeziela*, but with the outer margin broadly black, bordered inwardly with pale blue. Exp., 1⅜ inch.

Hab.: Chanchamyo, Peru (H. Whitely). Mus. Druce.

MESOSEMIA SYLVIA, *n. sp.*

Upper-side: anterior-wing dark brown, crossed at the middle by a broad band of greyish-white, a narrow white band crossing the middle of the greyish band from the anal angle to the end of the cell, a small black ocellus at the end of the cell, and an elongated black spot below. Posterior-wing, from the base to the middle, dark brown, from the middle to the outer margin greyish-white, the apex brown, a narrow white line crossing from the apex to the anal angle. Under-side pale brown, with the white bands more distinct than above. Anterior-wing: the ocellus and black spot surrounded by three waved lines of darker brown; the posterior-wing is crossed from the costal to the inner margin by nine waved lines of dark brown, the outer margin is broadly brown. Exp., 1½ inch.

Hab.: Bolivia (Buckley). Mus. Druce.

EURYGONA PHELINA, *n. sp.*

Upper-side uniform pale brown; under-side pure white. Anterior-wing crossed from the costal to the inner margin by five narrow bands of pale brown, the outer margin brown. Posterior-wing crossed by three brown bands not reaching below the cell, a large black spot in the middle close to the outer margin, and one small spot nearer the anal angle, the space between the spots yellow; a waved submarginal band of brown crossing the wing from the apex to the anal angle. Exp., 1¼ inch.

Hab.: Maracaibo, Venezuela (Moritz). Mus. Druce.

EURYGONA ALCMENA, *n. sp.*

Upper-side dark brown, palest at the apex of the anterior-wing. Under-side pale drab-brown, both wings crossed at the middle by a narrow orange coloured band, a faint waved brown line between it and the outer margin; the posterior-wing with a submarginal row of small black spots, the fifth the largest. Exp., ¾ inch.

Hab.: Ecuador (Buckley). Mus. Druce.

EURYGONA JULIA, *n. sp.*

Upper-side: anterior-wing dark brown, shaded from the base to the middle with rufous-brown. Posterior-wing dark rufous-brown, with the outer margins dark brown. Under-side dull white, the margins rufous. Both wings crossed by a continuous curved rufous line, slightly broken near the inner margin of the posterior-wing. Anterior-wing crossed by a submarginal faint brown line. Posterior-wing with a submarginal line of five black spots, minute, except the one nearest the costal margin. Exp., 1 inch.

Hab.: Santarem, Amazon (H. H. Smith). Mus. Druce.

The Beeches, Circus Road, St. John's Wood:
September, 1878.

NATURAL HISTORY OF *EBULEA VERBASCALIS.*

BY W. BUCKLER.

In the Entomologist's Weekly Intelligencer, vol. x, p. 71, is recorded the first information of *Teucrium scorodonia* being the food plant of *verbascalis* by Mr. McLachlan, who mentions therein the fact of his finding in the autumn of 1860 "larvæ, evidently *Pyralidæ*, on this plant," which, with true prophetic instinct, he refers to this species; from the brief description there given of the characters he observed in those larvæ, I have the fullest evidence now to offer in proof of the correctness of his judgment.

Dr. Hofmann, in his "Kleinschmetterlingsraupen," published in 1875, quotes first the Vienna Catalogue, wherein *Verbascum* is given as the food plant, and, secondly, adds that, according to Rössler, the larva should rather be sought on *Teucrium*; Rössler's work is dated 1864—66, four years after Mr. McLachlan had published his discovery.

On August 8th, 1877, I had the pleasure to receive from my friend, Mr. W. R. Jeffrey, two dozen eggs of this species, being part of a batch laid, a few days before, on both sides of some leaves of *Teucrium scorodonia*, beyond doubt their proper food plant, which had been ascertained the previous season by Mr. Jeffrey, who on this occasion kept a few of the eggs for himself, with advantage to our object of elucidating the history of this hitherto unknown larva.

The eggs hatched on 11th and 12th of August, and the young larvæ were supplied with *Teucrium*, on which they soon settled themselves, creeping under the leaves, each one by itself choosing a place whereon to spin a small layer of silk to secure its footing and soon to convert into a most minute tubular kind of gallery, which, in some instances, slightly united one leaf to another, if they were at all in contact. In a few days, they ate small holes through the leaves, and, after a moult or two, the holes became more conspicuous, so that as the larvæ grew their ravages indicated sufficiently well their situations on the plant; and, by the end of August, they had grown to be a quarter of an inch long, still protecting themselves with a little silk under the leaves; but as their growth increased, they no longer made any elaborate retreat, beyond occasionally turning down a part of a leaf with a few threads of silk, or more often by similar means attached one leaf to another as a screen or hiding place in which to lie sheltered: they were in their last coats when about thirty to thirty-five days old, and were full fed by the fortieth and spinning themselves up, mine in earthen cocoons, those of Mr. Jeffrey in sand, which his local knowledge enabled him to give them to make up in. Judging from the behaviour of the larvæ in captivity, they should be easily dislodged from the plants by shaking or beating, indeed, the first two larvæ I had to figure in 1876 were obtained in this way by Mr. Jeffrey at Folkestone as late as September 27th.

As to the moths, Mr. Jeffrey fortunately bred a few this summer on June 27th, 30th, and July 8th, although some of his larvæ, like the whole of mine, died in their cocoons during hibernation.

The egg of *verbascalis* is circular, flat and scale-like, colourless and semi-transparent; two days before hatching it begins to fill out gradually with some degree of plumpness on the upper surface, showing opaquely the embryo through the shell, which has on it numerous little glistening pits.

When first hatched, the larva is whitish, semi-translucent, and rather lively; when seven days old, it becomes slightly tinged with pale bluish-green, and about the nineteenth day, when a quarter of an inch long, shows faintly a stronger green dorsal stripe between two lines of whitish, some light brown freckles on the head, and most minute black dots sprinkled over the body: at the age of twenty-five days, its length is from three-eighths to nearly half-an-inch, when the pale head is more distinctly freckled with brown, the green stripe on the back and broad band of the sides are brighter, darker and broader than before, the two white stripes of the back appear more purely white, and a whitish spiracular line is seen extending from the third segment to the side of the anal legs, while beside the black dots, previously noticeable, one on either side of the third and fourth segments *is now conspicuously* larger than the others.

The full grown larva measures from six-eighths to seven-eighths of an inch in length, tapering at each end, the segments well divided, and beyond the fourth each is sub-divided by a deep transverse wrinkle on the back into two nearly equal portions; on the belly they are more deeply divided and very plump; the ventral and anal legs slender, the anal pair extended behind in line with the body: in colour the head is of a pale watery drab, finely dotted on the crown with black, and freckled with brown on the sides of the lobes, and a pair of blackish dots are a little above the mouth; the second segment has much the same pale ground colour as the head, and is also freckled with light brown on the side, where there is a conspicuous black elongated dot, and on the dorsal region is broadly marked, somewhat triangularly, with rich semi-translucent full green, which continues from thence as a broadish dorsal stripe of equal breadth as far as the eleventh segment, from whence it becomes gradually narrower to the thirteenth, having within it a darker pulsating vessel; this green stripe is bordered on either side by a rather narrower stripe of opaque-whitish, with its outer edge a little ragged and slightly melting into the rich translucent full green of the sides, inclining a little in part to bluish-green, this is again relieved by the spiracular stripe of yellowish-white, extending to the anal legs, having throughout its course along each segment a straight lower edge and a concave upper edge, thickening the stripe at each segmental division and thinning it in the middle of a segment, just where each round black spiracle is placed on it; the belly is of a very pale watery tint of greenish, and has the faintest possible paler line a little below the spiracles; the tubercular warts are of the ground colour on which they occur, each having a small central black dot with a fine hair; the whole skin very glassy and shining.

The cocoon is more or less of an oval shape, about half-an-inch in length by a quarter in breadth, externally covered with fine grains of sand or of earth, and internally lined smoothly with greyish-white silk, very tough in texture. The pupa measures three-eighths of an inch in length, is moderately slender and quite of the usual pyralideous form, the thorax being slightly keeled, the spiracles on the fixed rings of the abdomen rather prominent and larger than those on the flexible rings, the wing covers long, the leg and antenna cases longer still, extending a little free beyond them, the bluntish tip of the tapering abdomen has a more pointed dorsal prolongation, furnished with two very minute converging bristles; its colour is ochreous-brown and rather shining.

Emsworth: August 31st, 1878.

ON THE PUPATION OF THE *NYMPHALIDÆ.*

BY J. A. OSBORNE, M.D.

Whilst thanking Dr. Chapman for his information on this subject in the last number of your Magazine, I can by no means accept his suggestion that the membrane described by me "is neither more nor less than the linings of the tracheæ," because I find it existing along with, and in addition to, these exuviæ and those of the alimentary canal, which, moreover, I find not to have any influence in the support of the chrysalis; also, the attachment of this membrane to the chrysalis is at a point where no spiracle or other opening exists. I send herewith a few specimens, a look at which I think is sufficient to settle the point. The chrysalis of *Vanessa* was prepared last year, and is still in good condition; those of *Pieris brassicæ* were made a few weeks ago. One of these, in which the larva-skin has been turned inside out, shows the linings of the last tracheal tube on each side, and in the middle the triangular shaped ligament of suspension. Its apex is more pointed than it should be, because its attachment to the chrysalis is at two adjacent points, from one of which it had separated before drying. In removing the specimen, the second point of attachment has now given way also, but the dried skin retains its shape; and the two whitish points on the chrysalis, to which the membrane was originally attached, may be very easily seen. I do not think this membrane can be made out by simple observation, without a little manipulation. My method was to remove the caterpillar pupating, or about to pupate, from its attachment, lay it on its back, and when exclusion was somewhat more than half advanced, whilst making counter extension on the chrysalis, with a pair of pliers to seize the larva-skin on the ventral aspect and gently draw it down over the tail. The caterpillar skin will then turn inside out, like a stocking drawn off the foot, the linings of the tracheæ may be seen coming out of the spiracles, and that of the intestine from the anus, whilst the tough and persistent "larvo-pupal" membrane will be clearly defined. It is difficult, however, to preserve it longer than a few minutes, owing to the twistings and writhings of the insect, and its own tendency to rupture after desiccation, or rather to part smoothly from the chrysalis like the jointed petiole of a leaf; but when still fresh, considerable force may be used without detaching it, so that the chrysalis will be drawn out threatening to be torn asunder before the ligament will break. At this time of course there is nothing else holding the chrysalis and larva-skin together—no pinching of the folds of the latter between the rings of the former. The membrane is quite sufficient of itself.

This year I have reared several hundreds of the caterpillars of *Pieris brassicæ*, and, after cutting the loops and making them hang by the tail like *Suspensi*, I have watched their subsequent exclusion. Some 200 succeeded in fixing their tails in the silk, and remained suspended; while about 150, after a few *minutes'* endeavour, fell down, having failed to reach the silk with their hooks; some difference in the relative length of the tail and membrane probably determining the result. In some of the batches as many as two-thirds were successful in hooking themselves on by the tails, and I have no doubt, with more careful management, the proportion would be still higher. In several instances these *Pieris* caterpillars spun a *double* loop. I enclose a pupa of one of these.

Is not this membrane a persistent and specialized portion of the general subcutaneous connective tissue? persistent in part, as Dr. Chapman observes, for want of a *point d'appui* from which to act upon it before the tail of the chrysalis is fixed. In that case one would look for it, or something like it, even where no such purpose could be served by it as in the case of the *Suspensi*. Last year I watched the pupation of a small beetle (*Gastrophysa raphani*) in a great many instances, and found that it occupied very nearly about twelve minutes. But, whilst the pupa was completely excluded in about six minutes, something held the old skin so firmly to the tail of the pupa, that the rest of the twelve minutes was occupied in getting rid of it altogether. The old skin was not merely resting there, or adherent to a hair, but firmly attached, and not to be removed by a camel's hair brush. Of course, in the natural circumstances, where the insect would have crept under dead leaves or grass when fed up, and could have acted against these, it might have been able to rid itself sooner of the exuviæ.

Milford, Letterkenny:
September, 1878.

[We have forwarded to Dr. Chapman the preparations above referred to.—Eds.]

Pieris rapæ attacked by Microgaster.—Believing that the exhibition by Mr. Boyd of a larva of *Pieris rapæ* attacked by *Microgaster*, at a Meeting of the Ent. Soc. on November 7th, 1877, is the only evidence brought forward of that parasitism, I beg to say that I have to-day found a shrunken larva of the butterfly surrounded by some twenty cocoons of the familiar parasite.

I have this month bred several specimens of a Chalcid from a pupa of *P. rapæ*; and have, in former years, bred many specimens of a *Tachina* from pupæ of the same butterfly.

If it be desired, I think all three of these parasites may be introduced into America. The *Microgaster* could be sent as soon as its cocoons are formed; and numbers of the pupæ of the butterfly could be collected and forwarded, and though most of them would yield butterflies (which could be destroyed on emergence), some would be likely to yield *Tachinæ* and Chalcids.—J. E. Fletcher, Happy Land, Worcester: *August* 19*th*, 1878.

Acherontia Atropos and Thecla quercûs near Bedford.—I wish to record the capture of a specimen (♀) of *Thecla quercûs* on the 17th of this month, at an oak wood near the village of Stagsden, about four miles from here. From enquiries which I have made, it would appear that no specimen of this butterfly has been taken in the county of Bedford for at least many years past. It was about 5 p.m. when I took it, and the afternoon was very dull and cloudy.

A friend of mine also obtained a fine larva of *Acherontia Atropos* the day before, near the same place. This is also unusual here.—W. Greenwell-Lax, 101, Tavistock Street, Bedford: 26*th August*, 1878.

Acherontia Atropos in the Isle of Man.—This afternoon, about 3 o'clock, a large moth flew past me in one of the principal streets of Douglas, and settling upon the trousers of a boy, I was able to secure it. It proved to be a female specimen of *Acherontia Atropos*. This being, I believe, the first record of the occurrence of the insect in the Isle of Man, and the singularity of the place and hour of its flight, will perhaps excuse my troubling you to insert this notice.—Edwin Birchall, Douglas: *August* 29*th*, 1878.

Leucania extranea at Walmer.—I took a specimen of this rare British Noctua at sugar on the night of September 1st, at Walmer, in the precise locality where I took *L. albipuncta* last year. So far as I can ascertain, this makes about the fourth recorded British example of *L. extranea* (= *unipuncta*, Haw.).—R. Meldola, 21, John Street, Bedford Row, W.C.: 16*th September*, 1878.

Acronycta alni in the New Forest.—Perhaps the following may be of some interest to your readers. My son beat a very fine and healthy larva of *Acronycta alni* from an oak tree at Lyndhurst, on the 9th inst. It fed up, and is now going into the pupa state.—Henry Neale, 45, The Canal, Salisbury: *August* 23*rd*, 1878.

Pachnobia hyperborea (*alpina*).—I think it may be well for me to make public the fact that I know all the specimens of *Pachnobia alpina* mentioned in the letter addressed to Lord Walsingham, and published by him in your Magazine, to be British.

I have spent the whole season in Scotland this year, visiting various parts of the country, and, during my tour, I formed the acquaintance of Lord Walsingham's correspondent. He was working for *P. alpina* during the time I was staying in his neighbourhood, and I saw some of his specimens taken, and all of them after being taken. I myself took some beautiful specimens.—John B. Blackburn, Forres, N.B.: 9*th September*, 1878.

[We do not imagine that any one doubted the British origin of the specimens *alluded to.—Eds.*]

Miana furuncula.—In the present (September) number of this Magazine (at p. 91), the discovery of the larva of *furuncula* has been erroneously assigned to Mr. J. Gardner; whereas, in point of fact, this discovery was really made by Dr. Knaggs eleven years ago!

A brief account of the circumstance, together with a description of the larva while it retained all its characteristics, will be found in volume iv, p. 137.—W. Buckler, Emsworth: *September 2nd*, 1878.

Ennomos alniaria at Alverstoke.—On looking over a small collection made by a young friend resident here, I was surprised to see three specimens of *E. alniaria*, all of which he took last autumn on the gas lamps about here. I hope, if I remain, to be similarly fortunate.—E. F. Heath, The Brooklands, Bury Road, Alverstoke: *August 27th*, 1878.

Description of the larva of Acidalia imitaria.—On the 13th July last, at Thruxton, Hants, I captured a ♀ *A. imitaria*, which laid eight eggs on the following day. These hatched on the 22nd July, and the young larvæ fed up rapidly on lettuce, which they seemed to prefer to *Polygonum*.

When first hatched, the larva is extremely slender and thread-like, more so than the larva of any other species of the genus with which I am acquainted. Of the eight larvæ one was lost, and another died from the effects of a bite received from one of its companions, the remaining six attained maturity about the middle of August.

The full-grown larva may be thus described: length about one inch and a quarter, the head rather narrower than the 2nd segment and indistinctly notched on the crown, the face flat with the lobes rounded; the segments gradually taper from the 12th to the 2nd, they are transversely ribbed throughout and overlap each other at the divisions; the colour of the head is wainscot-brown, and of the dorsal surface of the body dirty greenish-ochreous, paler at the sides, especially on the skin-fold; the medio-dorsal stripe is very pale and hardly perceptible on the 2nd and 3rd segments, but on the 4th and succeeding segments is of a greenish-brown colour, which increases in intensity at the division of the segments and at the anal extremity; on each side between the medio-dorsal stripe and the spiracles are two very pale, indistinct, and irregular lines; the ventral area is pale dirty greenish, and there is a faint indication of a central line throughout its length; the spiracles are black, and there is a minute black dot on each side of the medio-dorsal stripe on the 4th, 5th, 6th, and 7th segments. On several of the segments there are a few, irregularly scattered, bristly hairs.

The larva spins a light cocoon of loose threads, mixed up with morsels of dried leaves. The pupa, which is about five lines in length, is of a golden-brown colour, excepting the wing-cases, which are ochreous-yellow.

The first four imagos emerged on the 10th instant, and the remainder on the 12th.

Notwithstanding the unusual food of the larvæ, the imagos do not differ, either in size or colouring, from the ordinary type of the species.—H. Goss, The Avenue, Surbiton Hill: *14th September*, 1878.

Note on Coccyx distinctana, Wilkinson.—In his Notes on British Tortrices in this *Magazine (vol. x, p. 65)*, Mr. Barrett, speaking of Coccyx distinctana, says that Prof.

Zeller considers it to be only a variety of *hyrciniana*, and he further writes me word that this is the general opinion of continental entomologists; but, from what follows, there can be no longer any doubt that it is a good species, and abundantly distinct from *hyrciniana*.

The perfect insect occurs here about midsummer among silver firs, and on these same trees in the autumn are to be found little larvæ which it would seem natural to infer are the progeny of the moths; but, inasmuch as they are very subject to the attacks of ichneumons and hibernate full-fed, the difficulty has been to prove the connection, and for three seasons I have tried in vain to rear them.

Under these circumstances, I have attempted the problem in another direction, and this summer enclosed a female moth in a bottle with a small sprig of silver fir. After a time, the spray became dry and mouldy, and was put aside as a failure. However, picking up the bottle by chance one day at the end of August, I saw that some larvæ had been at work after the manner of those I had been so long familiar with on the fir trees, and as the precaution had been taken to gather the spray from an isolated tree, on which neither the moth nor larva had ever been seen, and upwards of a mile from the locality of the insect, there could be no other conclusion but that they were the produce of the moth that had been imprisoned, and that at last the problem had been solved.

Distinctana differs from *hyrciniana* far more in the larval than in the perfect state. First, as to the difference in habits of the two larvæ. The food plant of *hyrciniana* is spruce; that of *distinctana* silver fir. The former feeds more or less through the winter; the latter becomes full fed in the autumn, though it does not pupate till the spring. Both feed within the needles of their respective trees, drawing several of them together with silk; but whereas *hyrciniana* does this in a loose and untidy manner, with no approach to the formation of a chamber, and makes use of a brown coloured silk in which much frass gets entangled, *distinctana*, on the other hand, draws the needles neatly and closely together, forming a small and compact chamber, quite free of frass inside and out, and with silk of a whitish colour. I may observe, it would be easy to overlook the larva of *distinctana*, and throw away one of its domiciles as untenanted, for the larva does not reside in the chamber (well adapted and even designed as it would seem for this purpose), but invariably within one or other of the excavated needles.

Second, as to the difference of the larvæ themselves. *Distinctana*: colour a very pale green, semi-transparent; head and plate on 2nd segment pale amber coloured; legs green; the usual spots are brown, and there is a dark dorsal line, but no other markings. *Hyrciniana*: colour at first green, but darker in tint and less transparent than in *distinctana*; head and plate on 2nd segment black; legs black; dorsal line not apparent, subdorsal line distinct and rather broad, reddish-grey; no other markings. When full fed the colour changes to a pale pink, and the head becomes brown.—John H. Wood, Tadcaster: *September*, 1878.

[The "silver fir" is *Abies picea*.—Eds.]

Mr. Moore's "Revision of the Lithosiidæ."—In the first part of the Zoological Society's Proceedings for the present year (pp. 3—36) Mr. F. Moore, of the India Museum, has published "A Revision of certain genera of European and Asiatic *Lithosiidæ, with* characteristics of new genera and species." As it is probable that a large number of English Lepidopterists do not see this work, I have thought that it might be useful to abstract from Mr. Moore's paper such parts as concern the arrangement of the British species of this group: (p. 9), *L. rubricollis* is the type of the genus *Atolmis* of Hübner (1816), which has precedence over Stephens' *Gnophria* (1829); (p. 14), *L. quadra* is the type of *Lithosia* of Fabricius (Ent. Syst. Suppl., p. 459, 1798); (p. 16), *Collita* is a new genus with *L. griseola* for its type, and including *L. complanula* and *stramineola* (?, also *complana*); (p. 16), *Katha* is a new genus, including *L. helvola*; (p. 17), *L. caniola* is the type of *Eilema* of Hübner (1816); (p. 18), *L. aureola* is the type of the genus *Systropha* of Hübner (1816); (p. 27), *L. muscerda* is the type of the genus *Pelosia* of Hübner (1816), which takes precedence over *Samera* of Wallengren. Differential characters, founded chiefly on the neuration of the wings, are given for all these and many other genera, the family *Lithosiidæ* being divided into two sub-families, *Hypsinæ* (all exotic) and *Lithosiinæ*, which latter again is divided into seven minor groups.—W. A. FORBES, St. John's College, Cambridge: *August* 15*th*, 1878.

Food of Tinea ferruginella.—The last week in August, 1876, I obtained a quantity of *Artemisia absinthium* (wormwood), and as it was gathered it was placed in a linen bag, for the purpose of obtaining the larvæ of *Cucullia absinthii*; the following week I searched it and found three; it was at once replaced, tied up tightly, hung up and remained until the 21st February following. I then searched it, with the view of finding *Eupithecia* pupæ, but was disappointed. During the search about half-a-dozen *Tinea ferruginella* flew out, which I captured; I then collected all the cases I could find; some were in pupa, others in the larva-state and feeding. Mr. C. G. Barrett, to whom some of the cases were sent, in a communication to me, says, "it was a "welcome and startling sight to find it cleverly clearing out the seeds from every "flower-head of the dry wormwood." The problem—on what does the larva of *Tinea ferruginella* feed?—is at last solved, so far that it is a seed-feeder, it may not always select *absinthium*, for I am informed that it has been taken where that plant is not known to grow, and, as my friend suggests, may it not feed on other composite plants? or is it confined to the species of *Artemisia*?—G. C. BIGNELL, Stonehouse, Plymouth: *6th September*, 1878.

Gracilaria phasianipennella.—This species we have generally only obtained as hibernated specimens flying in the sunshine in March and April, although Mr. Threlfall and I have long sought industriously for the larvæ on *Polygonum* and *Rumex*. Mr. Threlfall was searching for the larvæ at Witherslack, in the middle of August, with the usual result, when Mr. Murray (only a beginner), who was with him, found amongst some *Polygonum*, growing in a ditch, some cones of this species. Mr. Murray forwarded some of these cones to me, and on my opening the box *phasianipennella* flew to the window, and also several ichneumons.—J. B. HODGKINSON, 10, Torr Street, Buxton, Derbyshire: *September* 1*st*, 1878.

Lepidoptera at Wicken.—On July 22nd last, I went, accompanied by the Rev. T. W. Daltry, M.A., of Madeley, to the above locality, and we remained there collecting until August 3rd: for the time of the year we were fairly successful. Of the now rare *Orgyia cœnosa* we took five fine specimens at light in the Fen. *Nonagria Helmanni* was abundant, and we each secured a fine series. A few Aglossa cuprealis occurred about old stables and thatch; this species is probably pretty common in Cambridgeshire, as we found odd specimens in various localities miles apart. A *Nascia cilialis* came to the light on July 26th, and another was taken by a local collector the same night, though this was a late date for the species. *Tortrix dumetana* was not uncommon flying on the Fen at dusk, and also came to the lights later. Two *Macrogaster arundinis* were taken one night by a local collector during our stay, but we failed to get the species. The less rare species we took or noticed included *Zenzera æsculi*, *Cossus ligniperda*, *Nudaria senex* in abundance, *mundana* much less common, *Lithosia complanula*, *griseola*, very plentiful, several *stramineola*; *Epione apiciaria*, common, *Hemithea thymiaria*, *Hyria auroraria*, *Acidalia immutata* was about the most abundant geometer on the Fen; *emarginata* tolerably common, *Eupithecia succenturiata* and *absinthiata*, *Coremia unidentaria*, in abundance, *Phibalapteryx lignata*, common at light, *Ptilodontis palpina* in fine condition; *Thyatira derasa*, *Leucania pudorina*, *phragmitidis*, very common, *Apamea fibrosa*, plentiful at sugared flowers; *Miana furuncula*, *literosa*, and *arcuosa*; *Caradrina alsines*, *Agrotis ravida*, *Tryphæna fimbria*, *interjecta*, common, *Noctua rubi* and *umbrosa*; *Hydrelia unca*, *Herminia cribralis*, *Pyralis glaucinalis*, *Paraponyx stratiotalis*, not uncommon, along with the three more common "china-marks;" *Scoparia cembræ*, *mercuralis*, very abundant about thatch, several *lineolalis* in similar situations, *pallida* plentiful on the Fen, but mostly in bad condition; *Crambus pinetellus*, *perlellus*, *selasellus*, and others; *Chilo phragmitellus* abundant; *Melia sociella*, *Peronea Shepherdana*, common, *Orthotænia antiquana*, *Bactra uliginosana*, *Anesychia funerella*, &c. Of larvæ, we found *Papilio Machaon* pretty freely in all stages of growth, mostly on the wild carrot, but some were feeding on *Angelica*; *Smerinthus ocellatus* on willow; *Chærocampa Elpenor* (both varieties), *Cossus ligniperda*, one crawling on the floor inside the inn; *Saturnia carpini*, *Eupithecia valerianata*, common in the valerian flower-heads; *Cidaria sagittata*, full-fed, on the seeds of *Thalictrum flavum*; *Simyra venosa* on sedge; and *Pterophorus microdactylus* in stems of *Eupatorium*.

June had evidently been a good month at Wicken, as we saw three *Hydrilla palustris* in the local collector's boxes; and *Macrogaster arundinis*, *Meliana flammea* and *Nascia cilialis* had been taken in fair quantity.—Geo. T. Porritt, Highroyd House, Huddersfield: *September 4th*, 1878.

Habits of the larvæ of Tipula oleracea.—During the last twenty-one years I have resided in a house overlooking the north side of London fields, Hackney, and in almost every year there has been a flight of that most undevout of insects, the "daddy long-legs." Some three years since, a large section of the ground was ploughed up and sown with grass by the Metropolitan Board of Works, and a few months later it became apparent that the larvæ of the crane-fly existed in the soil by millions. According to a habit I have, I watched their customs, and the efforts made to extirpate them. In spite of fences, trenches, salt, &c., they succeeded in destroying acres of grass, apparently feeding above ground by night and under ground by day. How there came to be such a wonderful accession is unknown, and we asked whether the eggs came in the grass-seed, whether the bird-catchers who haunted the place had removed the natural enemy of the grub, &c., &c. Anyhow, there they were, nor did they confine themselves to the least trodden parts, but were specially abundant in some of the places most used as a playground. In the last case the indurated surface formed a roof over their heads, and through it they bored holes by myriads for their nocturnal raid. Though spreading from many small centres, their general advance was towards the north, until their course was stayed by a long narrow trench on that side. I now come to the one fact which struck me most. There are gas-lamps by the side of the main paths over the field, and I found that the lights attracted the larvæ which moved by night in immense numbers to the lamps, where, in some cases, they accumulated in writhing masses. The chief scene of this voluntary exposure to certain death was near a path which had wattled fences on each side, and under these fences, in close proximity to the lamps, they could have been thrown into heaps with a shovel. I thought that if lanterns had been hung up by night and shallow trenches drawn round them much might have been done to clear the ground, but the experiment was not tried. Thinking it desirable to protect the birds, an order was obtained to that effect; and this year the ground has been regularly frequented by a few rooks, a large colony of starlings, and a larger flock of sparrows. It is worth noting that the industry of the birds has been wonderful, that practically no harm has been done by the larvæ, and that, although daily on the watch, I have scarcely seen a single winged specimen.—B. H. COWPER, 250, Richmond Road, Hackney: *28th August*, 1878.

Neuroptera from France.—The Rev. A. E. Eaton, recently returned from a collecting tour in the Pyrenees, and the mountains of the southern central regions of France, that will be memorable in the annals of European Neuropterology. Starting towards the end of May, nearly a week was spent at Blois (Loire et Cher), "just to get his hand in" before proceeding to wilder districts. From May 30th to June 18th he collected in some of the best parts of the Basses Pyrénées, proceeding thence to the Department of the Haûte Garonne where he remained till the beginning of July, working the mountain region, afterwards paying a flying visit to Quillan in the Aude. The week comprised between the 15th and 22nd of the last-named month was passed at Toulouse, at which town not much was done, owing to intense heat and slight indisposition; from the 24th to the end of the month was spent in the Cantal, chiefly at the auberge termed "Le Lioran," the district around which has become familiar of late to our French colleagues. To this succeeded a few days' hunting in the rich (but little known) country about Mont Mezène in the Haûte Loire, the tour finishing (entomologically), on the 8th August, in the more barren Puy de Dôme.

During this time considerable hardship and some amount of privation had naturally to be endured, but the results have been such as to fully compensate for all. Mr. Eaton has amassed a host of materials for his forthcoming new memoir on the *Ephemeridæ*, many of them obtained by stripping and entering the water with a dredging net. In *Trichoptera* (and other groups of so-called *Neuroptera*) he has brought back vast stores, both pinned and preserved in fluid, to aid me in my work on the European *Trichoptera*, which, with an amount of self-sacrifice to which it is impossible for me to do justice in words, he has presented to me, to the extent of probably 1,400 specimens.

So important a contribution towards a knowledge of French *Neuroptera* has *never before* been made, and with its help, that of minor collections made by myself in *France at various times*, and the as yet too scanty materials collected by our neighbours in their own country, I hope it will soon be possible to form an idea in outline of the Neuropterous riches of France. I will only say here that there are probably many new species of *Trichoptera* in Mr. Eaton's collections: at present no systematic examination is possible, almost my whole time being occupied in relaxing and preparing the insects for study.—R. McLachlan, Lewisham: 12*th September*, 1878.

Rhophites quinque-spinosus and Acronycta alni near Hastings.—I have been fortunate enough to meet with a second specimen of *Rhophites quinque-spinosus*, having taken a specimen here (a female) on the afternoon of the 4th of August. It was at rest in a head of *Centaurea nigra*, and was so sluggish that it did not move when touched with my finger. On August 21st, I took a larva of *Acronycta alni* on some palings near Baldshow Mill. It was, I think, full fed, and would not eat after I got it.—E. N. Bloomfield, Guestling Rectory, Hastings: *September* 18*th*, 1878.

Is " Cyllocoris flavonotatus," Boh., a Globiceps or a Cyllocoris?—When Professor Boheman described the above-mentioned insect under the name of *Cyllocoris flavonotatus* in "Nya Svenska Hemiptera," p. 71, the close relations between the genera *Cyllocoris* and *Globiceps* were not set out, for this we have subsequently to thank Fieber. These genera are characterized by him in the "Europäischen Hemiptera." pp. 69 and 282: to the first he refers only *C. histrionicus*, Linn., the genus *Globiceps* consisting of the following species: *sphegiformis*, Rossi, *Picteti*, Fieb., *dispar*, Boh., *flavonotatus*, Boh., *flavomaculatus*, Fabr., and *selectus*, Fieb.

I would now examine the characters which Fieber gives for the genus *Globiceps*: at page 69 (No. 51), he puts "Kehle sehr kurz" as being a character common to *Cyllocoris* and *Globiceps*. *Globiceps sphegiformis* has, however, a very long gula; further, on the same page (No. 52), is "Kehle schief;" and concerning the genus *Cyllocoris* it is said: "Kehle aufrecht." But this difference does not exist in reality, and the *gula* in *Cyllocoris* is also oblique. There is, however, a difference between the structure of the *bucculæ* in *Cyllocoris histrionicus* and *Globiceps flavonotatus* on the one side, and the other species of *Globiceps* on the other side. In the former, the *bucculæ* on each side of the base of the rostrum are greatly extended (laminato-explanatæ), while in the latter they are very narrow, linear, and often scarcely distinguishable; further on, in the description of *Globiceps*, is "Schnabel an das Ende der Hinterbrust reichend, schwach-gliederig, Wurzelglied dick, etwas auf den Xyphus reichend;" and the genus *Cyllocoris* is characterized, "Schnabel an das Ende der Mittelbrust, Glieder stark, 3 und 4 verdickt, Wurzelglied weit auf den Xyphus reichend." In *Globiceps flavonotatus*, the rostrum reaches only to the apex of the mesostethium; the difference between the thickness of the joints of the rostrum in *Cyllocoris* and *Globiceps* is very difficult to make out, and the same is the case concerning the difference of the length of the first joint. The last two joints of the rostrum in *Cyllocoris* are by no means "verdickt," although they appear to be thicker than the second joint, if this is wrinkled after death, which often happens. I have, however, specimens of *C. histrionicus*, in which the second joint is distinctly stronger than the last two. We read further, "Mittelbrust hinten breit ausgeschweift;" and concerning *Cyllocoris*: "Mittelbrust hinten eingekerbt." The mesosternum of *Globiceps flavonotatus* is quite similarly constructed as in *Cyllocoris*, *and in these two species* it is very much more convex than in any other species of

Globiceps. Further: "Hinterfussglied 2 länger als 3;" in *Cyllocoris* it is "Hinterfussglied 3 länger als 2," in effect, in *Globiceps*, the last two joints of the tarsi are almost of equal length, but in *Cyllocoris* and also in *Globiceps flavonotatus* the third joint is distinctly longer than the second.

I pass now to the description, page 282, Gatt. 211, *Globiceps,* and cite here some of the characters: "Kopf in Nacken mit deutlicher Leiste." The neck in the females of most of the species is without ridge, and this is the case also with the male of *Gl. dispar.* "Fühlerwurzel etwas länger als der Kopf." In *Gl. sphegiformis* the first joint is about four times shorter than the head, and reaching not nearly to the apex of clypeus (♀). "Fühlerglied 2 beim Weibchen von der Hälfte an nach oben stärker keulig." This latter determination by no means accords with *Gl. flavonotatus*, which, on the contrary, has the antennæ in ♂ and ♀: "nur allmählig dicker," just as in *Cyllocoris;* but in the other species the above-mentioned character is common.

From what is now said, two conclusions might be drawn: the first, that the diagnoses of Fieber require an exact examination before they can be adopted as right; and the 2nd, that the limits which he has marked out are not always correct. It is, therefore, not wonderful if, in a new revision of the *Hemiptera* of Europe, many genera receive modification and change of place; nor that an author, who now treats on the difficult systematic characters of these insects, can come to other conclusions than an earlier writer, but this proceeds only from closer examinations and studies.*

Further, I find many reasons for believing that *Globiceps flavonotatus* does *not* belong to *Globiceps*, but is a *true Cyllocoris.* In my "Revisio critica Capsinarum," p. 120, I have already stated that *Glob. flavonotatus* is very different from the other species, and I have therefore formed for it a special sub-genus, *Dryophilocoris,* which was characterized thus: "Corpus supra pilosum. *Caput maris et feminæ haud globosum, consimile.* Vertex utriusque sexus marginatus. *Rostrum coxas intermedias haud superans.* Pronotum confertim punctatum, *callis obtusis* sed elevatis, pilosum, *angulis posticis* productis, *sub-reflexis. Coxæ posteriores distantes. Hemielytra utriusque sexus completa. Mas et femina consimiles;*" the characters, now italicised, being common also to *Cyllocoris.* This sub-genus is, however, not accepted in the "Catalogue des Hémiptères d'Europe" by Dr. Puton, but the species is still referred to the genus *Globiceps.* My examination has now, I think, brought to light that

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* For instance, many examples of this are to be found in the first volume of my "Hemiptera Gymnocerata Europæ;" and those, at p. 20, *ante,* have been made the subject of a disapproving remark, coupled with the expression that "modern genera are the most unstable idealisms, &c." Before I say more, I wait for the promised further remarks, and I should be grateful for the information they could give; at the same time they would furnish a greater reason for the more speedy development of the system on which my arrangement is based. At present I would only say that I also am not blind to the "idealism" of "modern genera," but I may perhaps take occasion to speak of this another time.—O. M. R.

[The remarks referred to will not appear in any definite time. We did not advert exclusively to Dr. Reuter's genera, although his work furnished the occasion for our observations. It must now suffice to say that in all cases genera are the idealisms of their authors, however natural the characters adopted as their basis, and there being no absolute rule for constructing or limiting genera, authors differ in estimating the generic value of the characters presented. Fieber, Stal, and Reuter may hereafter be shown to have taken too narrow views of genera, or Flor and Thomson be demonstrated to be too wide in theirs, yet in no case arising from any want of close examination and study, but from a different point of view of given factors. In the instance we cited, the genus *Psallus,* now made to include Fieber's genera *Apocremnus, Psallus,* p., *Atractotoma,* p., *Agalliastes,* p., *Liops,* p., is no longer *Psallus* of Fieb., but is the *Psallus* of Reuter, whose name is also appended; and if a future reviser, from another stand-point, again alter the *genus, and still retain* the name, it will be "*Psallus,* Fieb., Reut., Aliquis;" in this way genera *are unstable, and, as far as* the name is concerned, unsatisfactory.—Eds.]

Gl. flavonotatus, cannot be considered as forming a sub-genus of *Globiceps*, but that it is a true *Cyllocoris*, or at least a sub-genus of *that* genus. I give the comparative characters of these two genera:—

CYLLOCORIS.	GLOBICEPS.
Body very elongate, or almost oblong, *without* silvery-scaled spots. Head almost vertical, in ♂ and ♀ *similarly* constructed; *bucculæ extended;* clypeus more or less prominent. Rostrum reaching to the apex of *mesosternum.* The first joint of antennæ *at least as long as the head*, and reaching more or less beyond the apex of clypeus, distinctly *curved at the base;* the second joint in ♂ and ♀ almost *similarly* constructed, towards the apex *by degrees incrassated.* Pronotum with the callosities *not* or *scarcely* prominent, the base before the posterior angles *depressed*, so that the angles appear *a little reflected.* Hemielytra *developed in both sexes.* Mesosternum *very convex.* Metasternum with an obtuse tubercle at the exterior angle of orifice. Posterior coxæ *distant.* Posterior tarsi with the third joint *longer* than the second.	Body elongate, mostly *with* silvery scales. Head vertical, in ♂ and ♀ *dissimilar*, in ♀ more or less globose; *bucculæ linear;* clypeus not or scarcely prominent, *in the same plane* as the almost vertical frons. Rostrum reaching to the apex of *metasternum.* The first joint of antennæ *shorter than the head*, and reaching not to, or very little beyond, the apex of clypeus, *straight;* the second joint, *in the female*, from the middle *suddenly considerably thickened.* Pronotum with the callosities *prominent* and mostly *very convex*, posterior angles *not reflected.* Hemielytra very often *abbreviated in the female.* Mesosternum towards the apex *slightly* convex. Posterior coxæ *not distant.* Posterior tarsi with the third joint *not longer* than the second.

I think that the above-mentioned characters will be sufficient to show that *G. flavonotatus* is not a *Globiceps*, but a *Cyllocoris*, for all the characters given for this last genus accord with this species. I have found more than once, in the harmony of certain marks of colour, further evidence of the near affinity of some species; and wherefore should this not be the case, this accordance depending on a common derivation or descent? I have for a long time observed that the yellow cuneus in *Gl. flavonotatus* is black, *not on the apex*, as in *Gl. flavomaculatus* and *fulvipes*, but is marked with a black band *before* the apex, and I find that just such a similar marking exists in *Cyll. histrionicus.* A whitish spot or line is also to be found on the posterior margin of the vertex, both in *Cyllocoris* and *Gl. flavonotatus*, and the silvery scales, characteristic of *Globiceps*, are wanting in *flavonotatus.* Further, this latter species shows a greater accordance in habits with *Cyllocoris* than with the other *Globiceps*, for it lives on trees (oaks), while the species of *Globiceps* occur on low plants.

Finally, a few words on the synonymy of this species. On account of the description given by De Geer of his *Cimex flavoquadrimaculatus*, and which is rather exhaustive, I have already (Bidrag till Nord. Caps. Synon.) regarded it as certain that this description refers to *flavonotatus*, Boh., and not to *flavomaculatus*, Fabr., and having since, in Stockholm, examined the typical specimens of De Geer, I found my belief confirmed. Being so, it will be proper to call the species CYLLOCORIS FLAVOQUADRIMACULATUS, De Geer, although the name is rather long.—O. M. *Reuter, Berggatan 8,* Helsingfors, *August* 12*th*, 1878.

Vegetable moth trap from Brazil.—I have a large plant of *Physianthus albicans* (*Asclepiadæ*) trailing up the porch at my front door here, which grows rapidly, and, in the autumn, flowers in profusion. It is one of the most deadly moth-traps I know. Every day I find from two to eight humming-bird hawk-moths caught by the proboscis in the flowers, and they appear to die in about two minutes. I often find other insects dead in the flowers.—W. Simpson, Dartmouth: *August 30th*, 1878 (extracted from "The Field," *7th September*, 1878).

Living Beetle Ornaments.—"We have recently seen, on the shoulder of Mrs. J. Randolph Clay (wife of the Hon. J. Randolph Clay, so well known as a political representative of the United States), a living specimen of a beetle, worn partly as a decoration, partly as a pet, by the ladies of Central America. The tropical custom of confining living luminous insects in gauze, and wearing them in full dress, is doubtless well known to most of our readers; and the employment of the dead bodies of various species of *Buprestis* and other brilliant beetles as natural jewels or adornments for the trimming of dresses is also familiar. But the custom now under notice has, we believe, not before been recorded in this country, though doubtless known to American entomologists, and is exceedingly curious. The beetle employed is not, as might have been expected, one of resplendent hues or brilliant and highly contrasted markings. It is a large and somewhat cumbrous species of the *Tenebrionidæ* or *Heteromera*, a *Zopherus*, of considerable rarity in collections, as the genus to which it belongs is restricted to Central America from Mexico to Venezuela, probably living in very arid and desert localities. Mrs. Clay's specimen came from Merida, Yucatan, and is an inch and a half long, something like the well known *Pyrophorus* or luminous *Elater* in build, black beneath, with black legs and antennæ, and yellowish-grey on the upper side, with elevated shining black spots on the interstices of the wing-cases and on the thorax. It is confined by a slight encircling gold band at the base of the wing-cases, to which is fastened a thin flat strip of gold running down the suture, bent under the beetle at the tip, and having attached to it a slight gold chain, which is pinned to the shoulder of the wearer. It was received so decorated, in what is evidently the fashionable and usual method. A great peculiarity in it is its power of living for a very long time without food. Fanciful names are given to it, based upon a belief of its subsisting upon light, air, and other impalpable articles of diet; but the English naturalist, recalling the records of longevity in our own common cellar-beetle, *Blaps*, also belonging to the *Tenebrionidæ*, will probably see nothing poetical in this capability of the insect. Mrs. Clay has had her beetle six weeks only, and is ignorant for how long a period it was fasting before being sent to her; but it has eaten nothing during her ownership or during the voyage. The Mexican ladies amuse themselves by attaching their rings to the chain, and watching the beetle's efforts in dragging his precious load. One is irresistibly reminded of Gulliver in the fair toils of the Brobdingnagian princess and her suite."—(Extracted from "The Queen," *24th August*, 1878).

On the larvæ of Lytta vesicatoria.—I succeeded this year in the breeding of four larvæ (*triongulina*) of the *Lytta vesicatoria*.

I got the eggs from a female caught, *in copulâ*, about the 1st of June, and which laid them on the 6th in a little burrow in the earth. The eggs hatched a fortnight afterwards, and the little *triongulina* were left without any food until the 9th of July. On that day I had the luck to find in briars some cells of *Ceratina chalcites*, with honey and eggs or small larvæ of that melliferous bee over it. I presented the contents of the cells just as they were to my *triongulina*. They at once attacked, all four (each separately in a glass tube), first the larva or the egg of the *Ceratina*, and seemed to enjoy very much that animal feeding. Five days afterwards the *triongulina* changed their skin and made their appearance as soft white larvæ, without caudal setæ and their pointed mandibles changed to broader form, fit for eating honey; they left from that very moment the dead larvæ of the bee and resorted to the honey; another change of skin takes place five days after, and the head of the larva increases considerably while the eyes become obsolete. After five days more the larva, which begins to look very much like that of *Melolontha* (of small size of course), burrows in the earth and prepares a little cell, where it changes, in another five days, to a chrysalis or nymph, of the form of a *Meloe* pseudo-nymph. It becomes gradually of a chestnut colour, and . . . .

I am waiting to see what will become of it, as it is yet now without any change since the 9th July.

I note that the chrysalis extrudes some little drops of a liquid which I cannot examine, as the pupa is in a glass tube, and I will not disturb it. I do not know if it is normal or the effect of some illness.—J. LICHTENSTEIN, Montpellier: *August*, 1878.

On the stridulation of some Hemiptera, Hymenoptera, and Coleoptera.—The species of stridulating *Hemiptera* (*Reduviidæ*) that I have taken this summer in Italy, all performed similarly by placing the termination of their short and thick rostrum in a lenticular, striated groove, extending from the front edge of the prosternum to the insertion of the first pair of legs, and then rubbing this angulate point backwards and forwards by a nodding motion of the head from its prothoracic articulation;* the length and celerity of the movement perceptibly regulating the fulness and pitch of the notes, while the organic structures and frictional surfaces determined the gamut.

The first stridulator, the pupal form of *Reduvius personatus* ?, was taken, begrimed with particles of dust, within the folds of a muslin window blind at Ana Capri; the second, *Oncocephalus notatus*, Ramb., was captured in a railway carriage near Foggia: both in the month of May. During captivity, these would perform somewhat reluctantly on seizure: the notes of the first had the musical *timbre* of minute longicorn *Coleoptera* (*Leptura*, Fabr., and other anthophilous genera); those of the latter had a more rustling sound, which caused me repeatedly to think they arose from my having inadvertently crumpled the elytra. The third species, *Harpactor iracundus*, Scop., taken on the banks of the Po at 6 a.m. one June morning, when engaged in sucking the juices of a *Forficula*, was a more sturdy performer, with a sharp, creaking stridulation. And, although if retained for more than a second in the hand, its music would often subside to a tone scarcely perceptible by the human ear, yet, if the insect was then allowed to slip just a little through the fingers (this action apparently conferring some sensation akin to pleasure at release) the rostrum was seen at once to elongate its strokes in the channel, and the notes came out again loud and clear. When suddenly seized, it had also the power of emitting a strong vinegary scent. This species, and the one taken in the railway carriage, employed their rostrums to prick their captor sharply. A fourth stridulator, which is evidently the perfect winged form of *Reduvius personatus*, Wolff, I captured on the 18th July, at Madonna del Pilone, behind my window shutter; it performed readily, and its notes were sharp and distinct. This species is said to emit a disagreeable mouse-like odour (Suites à Buffon, Hemipt.). The fifth example (larva of *Harpactor iracundus*, Scop.) was taken under a hedge at Spezia at the commencement of May, with a small milky-winged insect on its right fore-tibia (which I subsequently gummed to the part)*; but notwithstanding the suggestive structure of the rostrum and the existence of the sub-thoracic groove, it would not stridulate on handling. These three musical species I have now noticed, with *Pirates stridulus*, *Reduvius testaceus*, and *Coranus subapterus*, will augment the number of *Reduviidæ* which have been observed to stridulate to six; while it may be also remarked, that this group of *Hemiptera* have hitherto evinced only one incentive to stridulate, namely, fear on seizure, although one species, like *Cryptorhynchus lapathi* among the rhynchophorous *Coleoptera*, was most disposed to do so when the paroxysm was passing off; and, further, that it has yet to be determined whether the several species, viewed in regard to sex and stage of development, present gradations in their capability for music or not.

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* *As already noticed in Coranus subapterus* and *Reduvius personatus*: vide Mitth. schw. ent. *Ges., iv, 159.—Eds.*

As regards Hymenopterous stridulators, I was able to procure females of *Mutilla hungarica*, F., at Ana Capri, some wandering on clayey spots, and others taken, covered with honey, emerging from the cells of a small violet bee, *Chalicodoma muraria*, F. These *Mutillæ* stridulated loudly on seizure, the sound produced by the captive drawing in and out beneath the hinder edge of the much elongated second segment of the abdomen, the striated raised and rounded shield on the front of the articulating surface of the third segment, by the contraction and protrusion of the last four segments that form a conical termination to this part. When first seized, they would produce a sharp sound—*tip! tip!*—by drawing this shield half under the second segment and then pausing; this note was then lengthened by a complete movement of the segment forward; and then the action lapsed into a quickly reciprocating double stroke, causing the note to rise in pitch. On seizure they also threatened with an elongate sting. Their organs of music closely resemble those of the longicorn *Coleoptera*, except in being placed on the abdominal rings in lieu of those of the thoracic division, and that the single *lima* is here the active agent, while there it is the passive.

I also took, at the commencement of July, on a willow sapling near Turin, where *Lucanus cervus*, some longicorn beetles, and insects of other Orders were collected sucking or licking sap, a stridulating male of the *Elateridæ*. This individual (*Lacon murinus*, L.), while I had it in captivity, would, on seizure, invariably lift its head, like others of this group, when preparing for a spring, but, instead of immediately afterwards depressing it to insert the elastic pro-sternal spine in the meso-sternal groove, it first nodded the head and thorax thrice with a movement and noise resembling that of a longicorn—*whee! whee! whee!*—a sound, I conceive, originated by the rounded superior surfaces of the twin claws that constitute the spine-point, which are faintly striate, vibrating over the entrance of the meso-sternal groove.—A. H. SWINTON, Turin: *July 25th*, 1878.

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* An *Aleurodes*.—EDS.

CHARACTERS OF NEW GENERA AND DESCRIPTIONS OF NEW SPECIES OF *GEODEPHAGA* FROM THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

II.

In resuming the subject commenced by me in this Magazine (vol. xiv, p. 142), I propose to furnish descriptions of the Hawaiian *Geodephaga* added to my collection during the interval, as well as of several previous captures that I have only recently been able to determine. The number of species is twenty-five; of which nine occurred on this island, the remaining sixteen on the great extinct volcano Haleakala (on the island of Maui). These latter were all collected upwards of 4000 feet above the sea, during four days in February, 1878. The altitude of Haleakala (10,000 feet) is much greater than that of the Oahu mountains, to which fact I attribute the considerable number of novelties among the insects I found on the former; for, during a week spent in other parts of Maui (similar in character to this island), I did not observe any new *Geodephaga*, and only two or three new *Coleoptera*. On Maui, as here, *Anchomenus* seems to be the prevalent Geodephagous type; all the *Geodephaga* I observed there (save one) belonging to that group.

The principal difficulty I have experienced in dealing with the following species, is their generic apportionment. Reluctant as I am to constitute new genera in groups where generic limits are already puzzling, I am obliged to do so in two instances. There are several species, moreover, of those which I have attributed to previously existing genera, which (it is my strong conviction) must be otherwise treated eventually; and on these a few comments seem desirable.

The last two species described under the name *Anchomenus* (*Sharpi* and *rupicola*) are remarkable insects. They differ from all *Anchomeni* known to me in the following points, viz.: the great development of the hind-body (head and thorax together making up less than one-third of total length), and the form of the mesothoracic epimera (which, instead of being very narrow and parallel according to the habit of *Anchomenus*, are triangular, almost as in *Bembidium;* indeed, barring form of palpi and tarsi, and shape of prothorax, *A. Sharpi* is extremely similar in build to *B. eques*, Sturm, with, however, the relative length of elytra not a little exaggerated). The latter of these two characters reads like something tangible; but Dr. Sharp informs me that he has observed a tendency to variation in the shape and development of these epimera among species accepted as *Anchomeni*. These two species (*Sharpi* and *rupicola*) are pretty closely allied to each other, and I think are both near to *A. mysticus*, mihi, and *Dyscolus Tantalus*, mihi (the latter of which, some slight tarsal peculiarities relegate to *Dyscolus* rather than *Anchomenus*, if these two genera are to stand. Without expressing any further opinion on that point, I may say that the four Hawaiian species mentioned above seem to me too closely allied *inter se* to be satisfactorily parted, and that as members of either genus they must rank among the most extreme of its aberrant forms).

Blackburnia frigida, I have located with some hesitation. Its eyes (though feebly developed in comparison of, say, a typical *Anchomenus*) are much more strongly developed than those of *B. insignis*, Sh., and *blaptoides*, mihi, and the defined suture between the 2nd and 3rd ventral segments constitutes a further perplexity. Moreover, the striation of elytra, and punctuation in general, are totally unlike those of the other species of *Blackburnia*. The form of the head, however, the very deep ventral sutures, the close adaptation of the elytra to the hind body, and the general "distinctiveness" of facies, accompanied by scarcely any tangible structural difference from *Anchomenus*, all point to this as its place.

HARPALIDÆ.

ATRACHYCNEMIS, *gen. nov.*

Mentum transversum, emarginatum, dente medio parvo instructum.

Palpi articulo ultimo elongato-oblongo, apice vix acuto.

Mandibulæ robustæ, productæ, minus arcuatæ, apice obtuso.

Labrum transversum, parum emarginatum.

Caput permagnum, thorace vix angustius nequâquam brevius, pone oculos parum contractum.

Antennæ capite thoraceque conjunctis vix longiores, articulo tertio pubescenti sequentibus longiore.

Pedes graciles, nec spinosi; tibiis anticis (maris solum?) arcuatis, intus profunde emarginatis; maris tarsorum anticorum intermediorumque æqualiter nec fortiter dilatatis.

Segmentorum ventralium suturæ solito profundiores.

Prothorax et elytra ut in Harpalis.

A. SHARPI, *sp. nov.*

Sat convexus, glaber, opacus (totâ corporis superficie æqualiter subtilissime confertissimeque punctatâ), piceo-niger, antennarum basi, palpis, pedibusque plus minusve rufescentibus; prothorace transverso, subcordato, canaliculato, antice parum emarginato, basi utrinque late (nec profunde) foveolato, vage profunde punctato, angulis posticis acute rectis; elytris parum elongatis, subparallelis, postice attenuatis, sulcatis, sulcis grosse punctatis, angulis humeralibus subrectis; prothoracis superficie inferiore, sterno, et abdominis parte anticâ grosse punctatis. *Long.* 7 *mm.*

Haleakala, Maui. At an elevation of 4000—5000 feet.

ANCHOMENIDÆ.

DISENOCHUS, gen. nov. (Argutoris aspectum simulans).

Mentum transversum fortiter emarginatum, dente medio obtuso instructum.
Palpi articulo ultimo oblongo, apice rotundato.
Mandibulæ minus arcuatæ, nec fortiter apice acuminatæ.
Labrum transversum, vix emarginatum.
Caput breve, latum, pone oculos haud angustatum.
Antennæ mediocres, ab articulo tertio pubescentes, articulo tertio parum elongato.
Prothorax subquadratus, convexus.
Elytra convexa, ovata, striolâ scutellari distinctâ.
Pedes robusti, breves; tibiis anticis fortius emarginatis, apice vix dilatatis.

D. ANOMALUS, *sp. nov.*

Convexus, nitidus, niger, antennis palpisque rufis; pedibus (præcipue genubus tarsisque) plus minusve rufescentibus; prothorace subquadrato, leviter transverso, antice vix emarginato, postice leviter angustato, basi utrinque impresso parceque punctato, angulis posticis leviter obtusis, lateribus minus rotundatis angustissime marginatis, margine basali medio convexo; coleopteris ovatis, striatis, striis (antice fortiter, postice obsolete) punctatis, interstitiis planiusculis, humeris sub-rotundatis. Long. 8½—9 *mm.*

Haleakala, Maui. Two examples, at an elevation of about 5000 feet.

ANCHOMENUS.

A. INSOCIABILIS, *sp. nov.*

Convexiusculus, nitidus, niger, pedibus (plus minusve) palpis, antennis margineque reflexo rufescentibus; capite magno; oculis prominulis; antennis corporis dimidio plane longioribus; prothorace vix transverso, obsolete subcordato, canaliculato, antice fere truncato, postice utrinque foveolato, lateribus parum rotundatis, angulis posticis obtusis; elytris ovalibus, fortiter striatis, interstitiis leviter convexis, humeris prominulis; tarsorum articulo quarto parum emarginato. Long. 8 *mm.*

A. epicuro aliquanto affinis.

Haleakala, Maui. One example, at an elevation of 4000 feet.

A. ERRO, *sp. nov.*

Præcedenti affinis, subconvexus, parum nitidus, piceo-brunneus, marginibus pallescentibus, antennis palpis pedibusque flavo-testaceis; capite mediocri; oculis prominulis; antennis corporis dimidio multo longioribus; prothorace leviter transverso, subcordato, canaliculato, antice leviter emarginato, postice utrinque breviter foveolato, lateribus parum rotundatis, angulis posticis obtusis; elytris elongato-ovalibus, subtiliter striatis, interstitiis planis, humeris prominulis; pedibus elongatis, tarsorum articulo quarto parum emarginato. Long. 8½—9 *mm.*

Haleakala, Maui. Elevation of 4000—5000 feet.

A. SHARPI, *sp. nov.*

Alatus, parum convexus, niger, antennis palpis pedibusque rufo-piceis; capite mediocri; oculis magnis convexis; antennis corporis dimidio paulo longioribus; prothorace fortiter transverso, canaliculato, antice emarginato, basi utrinque foveolato, lateribus parum (angulis posticis fortiter) rotundatis; elytris elongatis, parallelis, striatis, interstitiis planis, angulis humeralibus rectis. *Long.* 15—17 *mm.*

Haleakala, Maui. Not very rare, at an elevation of 4000—5000 feet.

A. RUPICOLA, *sp. nov.*

Apterus, convexus, piceus, antennis, palpis, pedibusque obscure rufescentibus; capite sat magno; oculis magnis convexis; antennis corporis dimidio paulo longioribus; prothorace transverso, canaliculato, antice sat fortiter angustato et leviter emarginato, basi utrinque foveolato, lateribus mediocriter (angulis posticis fortiter) rotundatis; elytris ovalibus, striatis, interstitiis planiusculis, humeris rotundatis, sine angulis distinctis. *Long.* 15—18 *mm.*

Haleakala, Maui. A few examples near the summit.

CYCLOTHORAX.

C. MONTIVAGUS, *sp. nov.*

Parum convexus, subnitidus, piceus, antennis, palpis, pedibus anguste, thoracis elytrorumque marginibus suturâque rufo-testaceis; capite mediocri, oculis prominulis; antennis corporis dimidio longitudine æqualibus; prothorace fortiter transverso rotundatoque, leviter canaliculato, antice haud emarginato, trans basin vage nec fortiter punctato, basi utrinque obscure foveolato, angulis posticis minutis, subdentiformibus; elytris breviter ovatis, subtiliter striatis, striis confertim fortiterque punctatis (marginem apicemque versus obsoletis), interstitiis planis, angulis humeralibus rotundato-rectis. *Long.* 5½—6½ *mm.*

C. (Olisthopo) insulari, Mots., *differt thorace basi minus fortiter punctato, elytris brevioribus, latioribus, &c.*

Haleakala, Maui. Elevation, 4000—5000 feet. Not rare.

C. MICANS, *sp. nov.*

Parum convexus, nitidus, piceus, antennis, palpis, pedibusque testaceis, marginibus suturâque obscure rufescentibus; capite mediocri; oculis prominulis; antennis corporis dimidio brevioribus; prothorace minus fortiter transverso rotundatoque, leviter canaliculato, antice leviter emarginato, trans basin sparsim punctato, angulis posticis minutis subdentiformibus; elytris ovalibus, subtiliter striatis, striis (marginem apicemque versus obsoletis) minus fortiter punctatis, angulis humeralibus rotundato-rectis. *Long.* 4—4½ *mm.*

Haleakala, Maui. Two specimens, at an elevation of 9000 feet.

C. MULTIPUNCTATUS, *sp. nov.*

Subconvexus, subnitidus, rufo-piceus, antennarum basi, palpis pedibusque (femorum basi, tibiisque nihilominus infuscatis) rufo-testaceis; capite mediocri; oculis convexiusculis; antennis corporis dimidio longitudine æqualibus; prothorace fortiter *transverso, breviter subcordato, canaliculato, antice parum emarginato, trans partem anteriorem subtiliter rugato, trans basin vage fortiter punctato rugatoque (nonnullis exemplis rugato solum), utrinque basi foveolato, angulis posticis subacutis; elytris ovatis, fortiter striatis, interstitiis planiusculis, serie duplici vel triplici profunde foveolatis, angulis humeralibus rotundato-rectis.* *Long.* 5¼—5½ *mm.*

Haleakala, Maui. Two examples, at an elevation of about 4000 feet.

C. BREVIS, Sharp (*in litt., nec descr.*), *sp. nov.*

Convexus, subnitidus, piceus, antennarum basi, palpis (plus minusve), pedibusque testaceis; capite mediocri; oculis parum convexis; antennis corporis dimidio paulo longioribus; prothorace fortiter transverso rotundatoque, canaliculato, antice leviter emarginato, trans basin confuse rugato vel punctato, utrinque basi foveolato, angulis posticis obtusis; elytris breviter ovatis, fortiter striatis, striis obsolete punctatis, interstitiis convexis, humeris leviter rotundato-productis, lateribus apiceque obscure rufescentibus. *Long.* 4½—5 *mm.*

Mountains of Oahu. Usually at elevations of about 2000 feet.

C. OAHUENSIS, *sp. nov.*

Convexus, nitidus, piceus, antennarum basi, palpis (plus minusve), pedibus thoracis elytrorumque marginibus lateralibus, suturâ apiceque testaceis; capite mediocri; oculis parum convexis; antennis corporis dimidio paulo longioribus; prothorace minus fortiter transverso, leviter solum rotundato, canaliculato, antice parum emarginato, trans basin obsolete punctato, basi utrinque foveolato, angulis posticis obtusis; elytris ovatis, striatis, striis obsolete punctatis, interstitiis planiusculis, humeris rotundato-rectis. *Long.* 4½ *mm.*

Mountains of Oahu. Rare.

C. SIMIOLUS, *sp. nov.*

Præcedenti affinis, at minor, colore obscurior; prothorace fere subcordato, leviter solum transverso, trans basin distincte punctato, angulis posticis acutis, subdentiformibus; elytrorum striis (marginem apicemque versus minus profundis) distinctius punctatis, humeris minus prominulis. *Long.* 3¾ *mm.*

Mountains of Oahu. Rare.

C. OBSCURICOLOR, *sp. nov.*

Convexus, subnitidus, piceus, thorace et elytrorum marginibus suturâque obscure rufescentibus, palpis (plus minusve), antennarum basi pedibusque (femorum basi tibiisque nihilominus plus minusve infuscatis) testaceis; capite mediocri; oculis parum convexis; antennis corporis dimidio longitudine æqualibus; prothorace fortiter transverso rotundatoque, breviter subcordato, canaliculato, antice parum emarginato, antice et trans basin confertim rugato, angulis posticis subacute rectis; elytris ovalibus, fortiter striatis, striis obsolete punctulatis, interstitiis convexis, humeris parum prominulis. *Long.* 3¾—4 *mm.*

Haleakala, Maui. Elevation, 4000 feet. Rare.

(*To be concluded in our next*).

INTRODUCTORY PAPERS ON FOSSIL ENTOMOLOGY.

BY H. GOSS, F.L.S., F.G.S.

No. 3.

Palæozoic Time.

[*On the Insecta of the Devonian period, and the animals and plants with which they were correlated.*]

In my second[*] paper I called attention to the sequence in which the existing orders of insects made their appearance on the Geological horizon. In this and the following papers I propose to enumerate some of the principal genera and species by which the existing orders were represented in past ages, and to allude to the other classes of animals, and to the plants with which they were correlated. I shall follow the ascending order of Geological succession, beginning with the oldest rocks *in which insect remains have been discovered*, and proceeding upwards to those of most recent date.

The six oldest known fossil insects were, as already[†] stated, obtained by Mr. C. F. Hartt, from the Devonian rocks of New Brunswick. The locality in which they were found has been named by their discoverer, "Fern Ledges," and is situated about a mile west of the town of Carleton, near St. John's. The rocks at this place are described as forming a series of ledges, exposed on the sea shore between high and low water mark, and consisting of beds of sandstone and fossiliferous shales, rich in plant remains. Some doubt as to the age of these rocks has been expressed by Dr. Geinitz, who considered them as probably belonging to the Carboniferous formation, from the fact that one of the insects obtained from them was associated with a fern, characteristic of that formation; but Dr. Dawson[‡] believes that from their containing beds "richly stored with Devonian plants," and underlying uncomformably the oldest portion of the Carboniferous series, they belong most unquestionably to the Devonian formation, and his opinion has been accepted by all the leading geologists in Europe and America.

As these Devonian insects are the most ancient representatives of their class, *yet discovered*, they are especially interesting, and are probably worthy of a more detailed notice than can be bestowed, in these papers, on the majority of those obtained from rocks of subsequent date. They have all been described[*] by Mr. Scudder, and respectively named by him: *Xenoneura antiquorum*, *Gerephemera simplex*, *Platephemera antiqua*, *Lithentomum Hartti*, *Dyscritus vetustus*, and *Homothetus fossilis*.

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[*] *Antea*, pp. 52—56 of this vol.

[†] *Antea*, pp. 52, 53 of this vol.

[‡] Geol. Mag., vol. iv, 1867, p. 386. "Acadian Geology" (2nd edit.), by Dr. Dawson, F.R.S. *The Quat. Journ. Geol. Soc.*, 1862 and 1863. Geol. Mag., vol. v, 1868, p. 175. "Manual of *Geology," New York, 1874, by* Professor Dana.

Xenoneura antiquorum and *Gerephemera simplex* were obtained from a lower portion of the shales than any of the others, and are, therefore, presumably, the oldest of the six. The first named fossil, *X. antiquorum*, appears to be the basal portion of a small wing, which was probably about two inches in expanse. From the peculiar nature of its neuration[†], Mr. Scudder is of opinion that it represents an extinct family of *Neuroptera*, and probably belonged to a group constituting a synthetic type between the *Orthoptera* and *Neuroptera*; he observes that the most striking peculiarity in this specimen is the development of apparently independent veinlets, forming portions of concentric rings, at the base of the wings, which he compared to the stridulating organ of some male saltatorial Orthopteron. Dr. Dawson[‡], in alluding to this peculiarity in this specimen, remarks that, "nothing is more "curious than the apparent existence of a stridulating or musical "apparatus, like that of the cricket, in an insect otherwise allied to "the *Neuroptera*. This structure also," continues Dr. Dawson, "if "rightly interpreted by Mr. Scudder, introduces us to the sounds of "the Devonian woods, bringing before our imagination the trill and "hum of insect life that enlivened the solitudes of these strange old "forests."

The second specimen, *G. simplex*, consists of a fragment of the tip of a large broad-wing, which appears to have belonged to a member of the *Ephemerina*.

The third specimen, *P. antiqua*, is believed to be a portion of the upper wing of a gigantic species of the *Ephemerina*, which must have measured five inches in expanse of wings, and from its combination of peculiarities[||] of structure, now only found in different groups, must also be regarded as a "synthetic type."

The fourth specimen, *L. Hartti*, is supposed to be a portion of the lower wing of a Neuropterous insect, measuring about 3½ inches in expanse of wings, and allied to the *Sialina*, but not belonging to any family represented among existing forms.

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[*] Geol. Mag., vol. iv, pp. 387, 388; v, pp. 175, 176. Acadian Geol., *antea cit.*, p. 525, and Dana's "Manual," *antea cit.*, pp. 273, 274.

[†] *Cf.* J. W. Kirby, "On the remains of Insects from the Coal-measures of Durham," Geol. Mag., vol. iv, pp. 388—390, plate xvii.

[‡] Geol. Mag., vol. iv, 1867, p. 387, and Acadian Geology, pp. 524, 525.

[||] Mr. Scudder *observes of this specimen*: "the intercalary nervules, which in Ephemerina "*generally originate* independently, arise here from a bent cross-vein, much as in Odonata." *Geol. Mag., vol. v, 1868, p. 175.*

The fifth specimen, *D. vetustus*, is represented by so small a fragment of a wing, that Mr. Scudder considers it impossible to determine the approximate size of the insect, or the family to which it belonged; though its characters are clear enough to shew that it was Neuropterous, and to distinguish it, with certainty, from the other specimens.

The last specimen, *H. fossilis*, consists of the greater portion of the upper wing of an insect, which Mr. Scudder believes to be the representative of another new family of *Neuroptera*, "synthetic in "nature, combining features of the *Odonata* and *Sialina*;" and he adds that though it is in a mutilated condition, the extent and character of every principal nervure can be determined.

Although these Devonian insects are the oldest *specimens* yet discovered, and consequently belong to the oldest known *species*, the *families* of which they were members had possibly existed for ages; and it must not be assumed that even their family types necessarily, or even probably, represented the earliest forms of insect life.

The appearance[*] of insects on the earth was probably synchronous[†] with that of land plants; and as remains of this division of the vegetable kingdom have been discovered in rocks belonging to the Silurian[‡] period, the existence of a land flora, long before the date at which these Devonian insects lived, is proved. The fact of the existence of land[§] plants at as early a date as the Lower Silurian period, appears to me to be an additional reason, to those previously given[||], for assuming the *probability* of the first appearance of insects at an earlier age than that of the Devonian shales at "Fern Ledges."

The other classes of animals, whose remains have been obtained from the same beds as the insects before described, are the *Crustacea*[¶] and the *Annelida*;[**] and the plant-remains include *Sigillaria, Stigmaria, Calamites, Asterophyllites, Annularia, Psilophyton, Cordaites,* &c., and ferns of the following genera: *Cyclopteris, Neuropteris, Sphenopteris, Hymenophyllites, Pecopteris,* and some others undetermined.

Although the number of species of animals and plants, immediately associated with these insects in the plant beds at "Fern Ledges," appears, from the remains which have been preserved, to have been inconsiderable, the total number up to the present time recorded from Devonian strata in various parts of the world, amounts to upwards of 5,600*. Of this number more than 5,300 belong to the Animal Kingdom, and are distributed amongst the *Protozoa*†, *Cœlenterata*, *Echinodermata*, *Vermes*, *Arthropoda*, *Mollusca* and *Vertebrata*.

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[*] It is not impossible, however, that insects *may* have appeared before land plants, which were not absolutely necessary to the existence of groups similar in their nature to the *Odonata* and *Ephemerina*, as they are essentially carnivorous, and aquatic in their early stages.—H. G.

[†] The theory of the existence of insects at an earlier age than the Devonian period would, however, be inconsistent with Häckel's opinion as to the date of the first appearance of the class. See *ante* p. 3 of this vol.—H. G.

[‡] Dana's "Manual," *antea cit.* p. 245. "The origin of the world," by Dr. Dawson, F.R.S., p. 330, London, 1877; and Proceedings of the American Philosophical Society, vol. xvii, p. 163 (October, 1877).

[§] Remains of land plants have been obtained by Dr. Scoville, Dr. Rominger and others, from rocks of *Lower* Silurian age. Proc. Amer. Phil. Soc., vol. xvii, *antea cit.*

[||] *Ante* p. 53 of this vol.

[¶] *Amphipeltis paradoxus, Eurypterus pulicaria*, and Trilobita.

[**] *Shells of Spirorbis.*

The *Protozoa* of this period are represented by *Foraminifera*; the *Cœlenterata* by *Spongia*, by a great number of species of *Actinozoa* (corals, &c.), and by one genus of *Hydrozoa*. The *Echinodermata* of the Devonian age are represented by *Crinoidea* (sea-lilies); the *Vermes* by *Annelida* (worms) and *Polyzoa* (lace corals, &c.); the *Arthropoda* by *Crustacea* (*Trilobita*, *Ostracoda*, &c.) and *Insecta* (*Neuroptera*, or *Pseudo-Neuroptera*); the *Mollusca* by *Brachiopoda*, *Lamellibranchiata*, *Gasteropoda*, *Pteropoda*, and *Cephalopoda*.

It will be observed that of the four classes of the sub-kingdom *Arthropoda*, two are represented, viz.: *Crustacea*‡ and *Insecta*§; but of the *Myriopoda* (centipedes) and *Arachnida* (scorpions and spiders) no remains have, so far as I am aware, been discovered in the Devonian rocks, and it is possible that animals of these classes had not at this period appeared.

The only *Vertebrata* of which the remains have been discovered in the Devonian rocks, are *Pisces*, the majority of which belonged to the order of the Ganoids: of this class upwards of 260‖ species have been determined; and it may be remarked that at this period the higher orders of the class appear to have been the dominant tribe of animals,—hence the Devonian period has been frequently called the "Age of Fishes."

The vegetation of this period seems to have been almost confined to Gymnosperms and Cryptogams—including *Coniferæ*, *Sigillariæ*, *Calamites*, *Asterophyllites*, *Lepidodendra*, &c.; and ferns of the genera *Cyclopteris*, *Neuropteris*, *Sphenopteris*, *Hymenophyllites*, *Pecopteris* and *Rhachiopteris*. There were also numerous *Algæ*.

The Avenue, Surbiton Hill:
7th October, 1878.

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* This calculation is of course liable to daily alterations as discoveries of new species are made known. See Introduction (p. 8) to "The Flora and Fauna of the Devonian and Carboniferous Periods," by Dr. Bigsby, F.R.S., London, 1878.

† I have followed the nomenclature and arrangement adopted by Mr. Pascoe in his "Zoological Classification" (1877).

‡ About 300 species of *Crustacea* have been obtained from the Devonian rocks.

§ *The 6 species before described.*

‖ "*Flora and Fauna of the* Devonian, &c., Periods," antea cit., pp. 100—106.

DESCRIPTIONS OF THREE NEW EUROPEAN *EPHEMERIDÆ.*

BY HERMAN ALBARDA [COMMUNICATED BY THE REV. A. E. EATON].

CENTROPTILUM TENELLUM, *n. sp.*

Imago ♂. Oculi turbinati atri, inferiores fusci. Thorax fuscus, politus. Alæ vitrinæ: anticæ nervis longitudinalibus prope basin, nervuloque humerali, castaneo-marginatis; posticæ ligulatæ, obtusæ. Pedes cretacei, coxis fuscis, femoribus tibiisque ad basin et apicem atro-fusco-cingulatis, femore antico insuper cingulâ præapicali ejusdem coloris. Abdominis segmenta 2—6 *cretacea, puncturis furfurosis; cætera saturate castanea, subtus virescenti-grisea. Setæ forcepsque albæ.* *Long. corp.* ♂, 3; *al.* 4; *set.* 4 *mm.*

Hab.: the single male in my collection was taken by Mr. Van Medenbach de Rooy near Arnhem, Holland, on the 8th September, 1878.

This pretty little species may be easily separated from *C. luteolum*, Müll., by the obtuseness of its hind wings, which are rather like those of *C. stenopteryx*, and from *C. pennulatum*, Etn., as well as *C. lituratum*, Pict., by its small size and dark markings.

ISONYCHIA FERRUGINEA, *n. sp.*

Subim. ♂ *et* ♀. *Oculi maris fuscis* (♀ *pallidiores*). *Thorax luteo-piceus. Alæ luridæ, ad margines fumatæ, nervis transversalibus nigris, fusco-marginatis; anticæ prope costam nebulis fuscis spatia pallidiora inclaudentibus. Pedes antici atro-picei, articulis tarsorum ad bases testaceis; posteriores testacei, tarsis fuliginosis, unguibus nigris. Abdomen fuscum, juncturis lineisque longitudinalibus abbreviatis in apices segmentorum binis obscurioribus. Setæ saturate testaceæ, ad bases obscuriores, pube brevi appressâ nisi ad juncturas ibique eâdem in verticillis divergenti. Forceps fusca.*

Imago ♂. *Oculi fuliginosi* [*inter vitam opace-, vel brunneo-carnei, cingulâ ex diametro ochraceâ, maculâ rotundâ (lineâve curvatâ) mobili nigrâ interruptâ intersecti.*—A. E. EATON.] *Thorax piceo-luteus. Alæ vitrinæ, areâ pterostigmaticâ vix lurido-tinctâ: nervorum longitudinales subtestacei, transversales nigri, tenues, iis tamen in areâ supra dictâ parum incrassatis exceptis. Pedes antici atro-picei, articulis tarsorum ad bases pallide testaceis; posteriores flavo-testacei, articulo unguinali infuscato. Abdomen ferrugineum, juncturis et in apicibus segmentorum lineis abbreviatis binis piceis. Setæ pallide cervinæ, apud bases fusco-obscuratæ. Forceps fusca, articulo terminali pallidiore.*

♀. *Mari pallidior. Tarsus anticus articulo unguinali piceo, cæteris albis, apicibus anguste piceis. Processus ventralis profunde emarginatus.*

Long. corp. 12—15; *al.* 10—14; *set.* ♂ ♀ *im.* 25, *subim.* 16 *mm.*

Hab. : *Holland* : Arnhem, Vasserbeck (Van Medenbach de Rooy);

South Holland (Van Walcheren); Rotterdam (Fransen). *France:* Amboise (Lelièvre); Toulouse, at gas lamps (Eaton). July and August.

AMETROPUS, *gen. nov.*

Imago. Tarsi posteriores quinque-articulati, tibiæ adnati suturâ subdiscretâ, articulo proximo modice longo. Abdominis segmentum penultimum (♀) *haud infra in laminam productum. Setæ tres longæ. Alæ quatuor. Oculi maris integri; forceps quadri-articulata, articulo proximo paulo (fere dimidio ipsius longitudinis) secundo breviore.*

[♂. *Tarsi antici femore tibiâque conjunctim duplo, vel hâc solâ quintuplo, longiores; articulo proximo pæne duplo longiore tibiâ, in subimagine tamen eidem subæquali: postici articulo proximo dimidio longiore secundo, hoc quinto, pariterque tertio quarto subæqualibus, tertio breviore secundo.**

♀. *Pedum anticorum tarsi longitudine femori tibiæque conjunctim subæquales; tibia vix longior dimidio femoris; proximo articulo tarsorum tibiâ parum breviori, cæteris decrescentibus et longitudine conjunctim tibiæ cum primo subæqualibus. Pedum posticorum tarsi femore parum breviores, femore tibiâ duplo longiore; articulo proximo et ultimo subæqualibus, singulis longitudine dimidio tibiæ æqualibus, secundo vel tertio duplo longioribus (his paribus), quarto omnium brevissimo.*

Affinities with the *Siphlurus-Heptagenia* series of genera, approaching *Oniscigaster* and *Bætisca* in the structure of the hinder legs, *Siphlurus* in the absence of the usual ventral lamina of the ninth abdominal segment of the female, and *Heptagenia* in the distribution of the veins adjacent to the inner margin (post-costa) of the anterior wing. The peculiarities of this neuration cannot be defined verbally in an intelligible manner.—A. E. EATON.]

AMETROPUS FRAGILIS, *n. sp.*

Subim. ♀. *Thorax supra dilute hepatieus, subtus testaceus. Alæ pallide fumatæ, nervis longitudinalibus pallide flavescentibus. Pedes testacei, tarsis, tibiis, femorum anticorumque apicibus infuscatis. Abdomen fuscum, juncturis late testaceis. Setæ testaceæ.*

Imago ♂. *Oculi fuliginosi. Tergum thoracis fusco-piceum. Alæ vitrinæ; nervi longitudinales pallide electro-colorati vel testacei, transversales limpidi atque in areâ pterostigmaticâ numerosi subsimplices lenteque curvati. Pedes antici testacei, femoribus post medium tibiisque obscure piceis: posteriores pallide flavescenti-lutei. Abdomen supra saturate fuscum, ad latera juncturasque testaceum; subtus flavescens, segmentis ultimis duobus infuscatis. Forceps testacea. Setæ albidæ.*

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* These proportions are stated somewhat in detail in the absence of figures. Even in figures of the legs of *Ephemeridæ* it is always necessary to make allowances for possible minor variations in the exact proportional lengths of the parts in individuals and in different species.—A. E. E.

♀. *Alarum nervi longitudinales testacei. Pedes antici rufo-picei, femoribus ad bases et juncturas, articuloque unguinali tarsorum, testaceis. Setæ pallidissime cervinæ, ad bases rubiginosæ.*

Long. corp. ♂, 15, ♀, 13; *al.* ♂, 14, ♀, 15; *set.* ♀ *im.* 22, *subim.* 12 *mm.*

Hab.: of this delicate looking species 1 ♂ im. and 2 ♀ subim. were taken near Arnhem (Holland) by Van Medenbach de Rooy, and 1 ♀ im. near Rotterdam by Fransen, all of which are in my collection.

Leeuwarden: *September*, 1878.

LIST OF THE *HEMIPTERA* OF NEW ZEALAND.

BY F. BUCHANAN WHITE, M.D., F.L.S.

(*Continued from page* 76).

Tribe CAPSINA.

Professor Hutton mentions no *Capsina* in his list of New Zealand insects, but Mr. Walker described three, which are reduced to two by Mr. Butler. Amongst the species now before me, none agree with the descriptions of the Walkerian species.

33. *Megalocerœa* (*Megalocerœa*) *Reuteriana*, *n. sp.*

Linear, elongate, pale testaceous; head with a central longitudinal line and a line behind each eye, pronotum with the front margin, a longitudinal band on each side of the central line (running on to the apex of the scutellum) and an indistinct band on each side between that and the margin, scutellum with the basal angles, sternum with a longitudinal band on each side, sometimes continued on the abdomen, back of abdomen with a broad longitudinal band, fuscous-brown; last three joints of antennæ dusky reddish, especially upwards; antennæ (especially the stout basal joint) and legs with short black spiny hairs; middle and hind femora with indistinct small pale brown spots; apex of tarsi pitchy.

♂ ♀. Length, ♂, 5, ♀, 7 mm.; breadth, ♀, 1¾ mm.

Three specimens from Mr. Wakefield. The markings vary much in intensity; the hemielytra seem a little clouded with brownish. A broken (♂) specimen is altogether much darker, but in too bad condition to describe.

MORNA, *n. g.*

Body oblong-oval, robust, nearly glabrous, punctate. Head shortly triangular, clypeus rather prominent. Eyes large, situated near and extending beyond the apex of pronotum, slightly emarginate on their inner side. Rostrum reaching to the mesosternum, the first joint attaining the base of the head. Antennæ inserted in front of the eyes, pilose, first joint stout, reaching far in front of the head, second thickened towards the apex, third and fourth slender and together much shorter than the second. Pronotum broadly convex, flattish on the disc, and with a distinct callus on each side anteriorly; posterior breadth nearly double the length and more than double the anterior breadth; distinctly collared; sides distinctly margined and subreflexed; hind margin slightly overlapping the scutellum. Scutellum nearly equilateral, with a sharp, narrow, transverse depression near the base; apex shortly spinosely pointed. Hemielytra with a longish triangular cuneus, with well marked fracture. Tibiæ scarcely spinulose. First joint of tarsus stout, about twice as long as the second.

Resembles in facies *Capsus*, F., Fieb. (*Deræocoris*, Kirsch., Reut.). Type, *M. capsoides.*

34. *M. capsoides, n. sp.*

Shining testaceous-brown, more or less tinted and clouded with wine-red; antennæ, apex of rostrum, of femora, and of tibiæ, tarsi, and a patch on the corium in front of the cuneus, usually more intense in colour; sides of pronotum and a line from the clypeus to the apex of the scutellum (which on the pronotum and scutellum is more or less unpunctured) generally yellowish-testaceous. Head sub-rugose, impunctate, clothed with fine pale hairs; antennæ with many black hairs, the slender last two joints together about one-half the length of the second; side margins of the pronotum callous, and distinctly concave, the collar and the callosities on the disc impunctate; scutellum transversely rugose, punctures rather obsolete.

♂ ♀. Length, 7—8 mm.; breadth, 3—3¼ mm.

Captain Broun. Four specimens, more or less broken. Judging from them the species varies much in intensity of coloration.

35. *M. Scotti, n. sp.*

Shining reddish-brown, with variable blackish and bone-white markings, very sparingly clothed with fine pale hairs; clypeus and vertex with various irregular spots often confluent, pronotum with irregular spots anteriorly and a more or less distinct transverse band posteriorly, and sometimes some small spots of the scutellum, pitchy-black; hemielytra pitchy-black, clavus at the apex with more or less confluent spots, corium with the basal half of front margin broadly and an irregular band extending from the base to the inner apical angle, cuneus (except the apex and some spots), more or less distinctly creamy-white; membrane whitish, spotted with fuscous; hind margin of the pronotum and indications of a central longitudinal line from clypeus to apex of scutellum, whitish or brownish-white; legs pitchy-black; femora with apex and ring near it, tibiæ with rings, whitish. Second joint of antennæ longer than the rather slender last two joints together; sides of pronotum rather acute, reflexed, nearly straight. ♂ ♀. Length, 5 mm.; breadth, 2 mm.

Messrs. Hutton and Wakefield. Four specimens, very variable in the intensity and distribution of the coloration. The much smaller size and different colour, as well as the shape of the pronotum, at once distinguish this from the preceding.

36. *M. sp.* ———?.

Three specimens from Captain Broun seem to belong to a third species, allied to *M. Scotti*, but smaller and differently marked. I reserve a description till I have seen more and better specimens.

REUDA, *n. g.*

Body oblong oval, nearly glabrous, coarsely impressedly punctate. Head longly triangular, clypeus produced for about half its length in front of the side lobes. Eyes prominent, not very close to the apex of the pronotum, and extending beyond it for nearly all their breadth. Rostrum reaching to the metasternum, and the first joint to the base of the head. Antennæ inserted in front of the lower anterior angles of the eyes, pilose, first joint not attaining apex of head, second thickened upwards, third and fourth very slender, together about half the length of the second. Pronotum broadly convex, elevated posteriorly, posterior breadth more than double the length and about four times the anterior breadth; distinctly and rather broadly collared; sides rather obtusely margined, with a rounded expansion behind the collar, then straight to the rounded hind angles; hind margins nearly straight, overlapping the base of the scutellum; disc anteriorly with a tubercle on each side behind the collar. Scutellum equilateral, with a transverse depression behind the base, disc with a broad, shallow, longitudinal channel, apex produced into a broad short spine. Anterior margin of corium broadly expanded and slightly reflexed; cuneus with a well-marked suture. First joint of hind tarsus longer than the second.

Somewhat allied to *Capsus*, Fieb.

37. *R. Mayri, n. sp.*

Brownish-testaceous, with numerous irregular brown spots; disc of the pronotum with an irregular V-shaped mark, and the anterior margin of the corium and base and apex of the cuneus with rather larger spots; antennæ dark brown, base of second joint, and base and spot on the inner side of the first, yellowish-white; legs yellowish with dark brown rings, tarsi dark brown; membrane fuscous with paler streaks; venter dark brown with pale spots; pronotum with a callous elevated longitudinal central line, irregularly expanded on the disc and interrupted before the hind margin, pale yellow. ♀. Length, 5 mm.

Of this curious species I have seen one tolerably perfect example, and fragments of two others, all taken by Captain Broun.

38. *Capsus laticinctus*, Wlkr. (*C. ustulatus*, Wlkr.).

39. *Leptomerocoris maoricus*, Wlkr.

This and the preceding I have not seen.

In addition to the species mentioned above, I have three (or more) others belonging to this tribe, and apparently referable to two new genera, but as they seem extremely variable, it will be better to merely indicate their occurrence till I have seen more and better specimens.

40. *sp.*——, or perhaps two species. Messrs. Broun and Wakefield.

41. *sp.*—— } or possibly four species. Messrs. Broun and Hutton.
42. *sp.*—— }

(*To be continued*).

ON A NEW HORN-DEVOURING *TINEA*.

BY H. T. STAINTON, F.R.S.

Lately I received a box of insects to determine for Mr. W. Machin: amongst them were three specimens of a very large *Tinea*, with the information that they were taken by Mr. C. W. Simmons in his conservatory.

After duly examining the specimens, and coming to the conclusion that though nearly allied to my *Tinea gigantella*, from South Africa (*Scardia vastella*, Zeller), it was a distinct and unknown species, I wrote to enquire if there were any *horns* in Mr. Simmons's conservatory, and, if so, from what part of the world they came.

In due course I heard as follows from him:

"Some time since, I had a piece of buffalo horn given to me in "order to cut a handle for a walking stick, but not having time to spare "just then, I put the piece of horn in the green-house on one of the "top shelves, which was then partially empty. Shortly afterwards, the "shelf was filled with flower-pots and the horn became obscured from "sight, and, until the arrival of your letter, I did not think anything "more about it.

"Upon looking at the piece of horn I find that it bears evident "signs of the presence of larvæ, or perhaps I ought to say of the *late* "presence of larvæ; and beyond this I found some empty pupa-cases, "one of which I have saved, lying alongside of it.

"I have made enquiries and have ascertained that this piece of "horn came from Singapore; and I have no doubt the *Tinea* is a species "*which has been imported* from there."

For this novelty I propose the name of—

TINEA ORIENTALIS,

and have thus described it:

Exp. al. 8—11 lines, the largest specimens fully equalling the smaller specimens of the South African *vastella*, Zeller (*gigantella*, Stainton). Anterior-wings *grey*, rather glossy, with a faintly darker discoidal spot—(the male specimen, which is rather worn, is paler and more ochreous-grey)—*no black at the base of the costa*; cilia dark *grey*. Posterior-wings with a tuft of long scales at the base, dark grey, with a purplish gloss; cilia pale *grey*. Head and face ochreous-yellow. Thorax dark grey. Antennæ rather thick, dark grey. Palpi with the 2nd joint dark brown, the short terminal joint ochreous.

Three specimens (1 ♂, 2 ♀), taken by Mr. C. W. Simmons, at Poplar, in his conservatory, in which was a buffalo horn from Singapore.

Mountsfield, Lewisham, S.E.:
October 16*th*, 1878.

Harpalus tenebrosus at Bridlington.—At the end of August, I took a fine specimen of *Harpalus tenebrosus*, at Bridlington, Yorkshire; as far as I know, it has not before been recorded from a locality so far north. *Nebria livida* was abundant at the same time and place: on hot days, it seemed to prefer sandy places part way up the low cliffs, and was then very easily obtained—as a rule, however, it was to be got by splitting the clay boulders, an operation requiring a good deal of hard work and perseverance. It was invariably concealed, and never to be seen running in the sun: it seemed, too, though abundant, to be gregarious and local.—W. W. FOWLER, Repton, Burton-on-Trent: *October*, 1878.

More enquiries about Plant-lice.—Following up my ideas about the cycle of life of the Aphidians, I bred this year a good quantity of plant-lice, mostly of the family of the Pemphigians (*Pemphiginæ*, Passerini). My last and most important discovery was the sexuated forms of the apple tree-louse (*Schizoneura lanigera*); they consist of small insects *without rostrum* and with five-jointed antennæ, the length being, for the ♀, 0·63 mm., and for the ♂, 0·50 mm. As with *Phylloxera*, and, in fact, with all Aphidians I am aware of, these sexuated little creatures are laid by a winged-louse, of what I call the "pupiferous" form. The act of depositing the little pupæ, out of which the sexuated insects come almost immediately, takes place in the same way as the laying of an egg; yet the best proof that it is not an egg but really a *pupa*, is that with this louse, and still more clearly with the poplar leafstalk-louse (*Pemphigus spirothecæ*), the *pupa* is so transparent that the sexuated female and the large egg which she carries in her abdomen are perfectly visible. Now, as the true egg is inside, the skin in which it is enveloped, along with the female, represents a chrysalis or pupa, and not an egg.

An Englishman, Sir Joseph Banks, has given, in 1819, in the Trans. Hort. Soc., vol. ii, pp. 162—169, a note on *Aphis laniger*. I should like to know, as I cannot procure the work here, if he speaks of the sexuated insects, or if they were unknown *to him*.

It is most striking, that while the sexuated forms are deprived of rostrum in *Schizoneura lanigera*, they possess that organ well developed in the closely allied *Schizoneura corni*, and also that this last insect has two winged forms in the course of its life, the *emigrant* and the *pupiferous*; but *Schiz. lanigera* has only the last form winged, and the *emigrant*, or second larval form, is apterous.

Up to this day, I know the males and females in 14 species, viz.:—

WITH ROSTRUM (*Sexuata rostrata*).

1.—*Schizoneura corni* .... discovered by Leuckart ....1858.
2.—*Vaccuna dryophila*........ ... „ „ Huxley...............1858.

WITHOUT ROSTRUM (*Sexuata erostrata*).

3.—*Phylloxera coccinea* ....discovered by Balbiani ....1874.
4.—*Pemphigus cornicularis* ...... „ „ Derbes ....1872.
5.—*Phylloxera vastatrix* .... „ „ various persons ...1875.
6.— „ *quercus* .... „ „ myself ....1874.
7.— „ *acanthochermes*.. „ „ „ ....1875.
8.—*Pemphigus filaginis* .... „ „ „ ....1878.
9.— „ *Boyeri* .... „ „ „ .... 1877.
10.— „ *cærulescens* ...... „ „ „ ....1877.
11.— „ *spirothecæ* ...... „ „ „ ....1877.
12.—*Tetraneura ulmi*............... „ „ „ ....1877.
13.—*Schizoneura lanigera* .... „ „ „ ....1878.
14.—*Aploneura* n. sp.? (*lentisci*?) „ „ „ ....1878.

I should feel very obliged by any information about the sexuated forms of the following species, which are unknown to me, viz.:—*Pemphigus lactucarius*, *vesicarius*, *bursarius*, *coluteæ*, *follicularius*, *semilunarius*, *cornicularius*, *utricularius*. *Schizoneura ulmi*, *lanuginosa*, *venusta*. *Phylloxera corticalis*. *Vaccuna alni*.

By keeping winged lice in a glass tube, they generally give birth to their *proles* in a few days. If the young ones look all alike, it is not the sexuated generation, but if some are small and others about a fourth part larger, then it is surely the sexuated period, and the winged insect is the *pupiferous* form.—J. LICHTENSTEIN, Montpellier: 17*th September*, 1878.

Developed membrane in British Pyrrhocoris.—In the valuable "British Hemiptera," p. 164, Messrs. Douglas and Scott, when describing the scarlet, black-spotted *Pyrrhocoris apterus*, from South Devon, say:—"Membrane (in all British examples) rudimentary; when developed, it has (according to Herrich-Schäffer, 'Wanz.,' ix, 173) two somewhat regular cells in the middle of the base, from which eight irregular forked nerves spring." It may, therefore, be not uninteresting to note that among five examples of this species, sent to me from South Devon for naming, is one in which the left elytron has a large and most perfectly developed membrane, not truncate, but ovate at the apex. It is smoky-brown in colour, with the nerves somewhat darker; at the base are four oblong cells, that nearest the front margin the broadest; the two middle cells have a small cell between their united apices, springing from which, and from the broadest basal cell, three other cells are clearly to be traced; *there are also indications* of others; but the neuration becomes so evanescent towards the margin that definition is scarcely possible. The right elytron has a slight tendency to development, as in another of these specimens; the thin truncated apex being longer than in ordinary examples.—E. C. Rye, 70, Charlwood Road, Putney, S.W.: *29th September*, 1878,

Hemiptera near Norwich.—The almost unprecedented amount of wet weather which has prevailed in this district throughout the past season has made insects very scarce. The following, however, may be worth recording: *Idiocerus Heydeni*, off Lombardy poplar in one locality near here, in company with *I. H-album* and *populi*. *Chilacis typhæ*, one example by sweeping near some pits at Swanton Morley. *Psylla visci*: I had no opportunity of looking for this insect in May, but took a few examples of the summer brood at East Carlton in August. It remains most unaccountably scarce, as I have worked its food-plant well on three occasions, but have not taken a dozen specimens in all. *Typhlocyba Douglasi*: I took several examples of both sexes on beech and lime a few days since. I have mounted one of the males for the microscope, and find my former observations and figure (vol. xiv, p. 248) verified in every respect, so that I am more than ever certain of the distinctness of the species. *Typhlocyba debilis*, Douglas, one ♀ on beech.—James Edwards, Bracondale, Norwich: *20th September*, 1878.

On the pupation of the Nymphalidæ.—I have carefully examined the specimens prepared by Dr. Osborne, and forwarded to me by the Editors of this Magazine. They shew very plainly that the "membrane" he describes is by no means the spiracular lining as I had imagined, but is a structure certainly possessing special relationship to the suspension of the pupa, and that Dr. Osborne has really made a new and interesting observation. I speak subject to correction, possible on observing fresh specimens, but the specimens seem equally clearly to show that the "membrane" is not a special and separate structure, that it is not a third, or part of a third, envelope, distinct from the larval and pupal skins, and that its triangular form is due to Dr. Osborne's method of preparation. The 13th segment (8th abdominal) consists of two portions (strictly two segments), the segment proper and the anal tubercle, the latter forms the hook-covered tubercle, by which suspension takes place; the segment proper is reduced on its ventral aspect in the pupa to a narrow line, presenting two distinct small rounded tubercles. In the specimens, these tubercles are distinctly hitched into a fold of the larva-skin, and must thereby give increased security to the suspension of the pupa, this must be by the portion of skin posterior to them. In Dr. Osborne's specimens, a triangular ligament is shown by the reflection of the skin backwards, the triangle having its apex at these tubercles, and consisting of the double fold of the skin, the anterior portion being thrown back over the truly suspensory posterior portion.—T. A. Chapman, Hereford: *7th October*, 1878.

Leucania vitellina at Torquay.—On the evening of the 14th September, in company with my friend, Mr. A. H. Jones, of Eltham, I captured at Torquay a very fine male specimen of *Leucania vitellina.*—R. S. Standen, Holmwood Lodge, Surbiton: *October 4th, 1878.*

Leucania extranea and vitellina at Torquay.—I had the good fortune to capture at Torquay, on the 13th September, at sugar, a very perfect *Leucania extranea* ♂, and on the following evening a *Leucania vitellina* ♀. On the 16th, I found at rest on grass a second specimen of the last named species.—A. H. Jones, Shrublands, Eltham: *1st October*, 1878.

Heliothis scutosa in Co. Donegal, Ireland.—I took a specimen of this rare insect on the 19th of August last, in the North of Co. Donegal. It was hovering over heather in bloom about 3.30 in the afternoon. The sun was very strong at the time, and there were a great many insects on the wing. I did not know the species, so I sent it to Mr. Birchall, who kindly named it for me.—W. H. Campbell, Ballynagard House, Londonderry: *23rd September*, 1878.

Description of the larva of Selidosema plumaria.—Several specimens of this species I took in the New Forest, on July 31st last year, deposited eggs. These began to hatch during the third week in August, and the larvæ fed well until autumn on the common ling. By the first week in December the largest specimen was about an inch long, but the majority were from half to three-quarters of an inch. They fed sparingly on withered ling shoots and leaves through the winter, and by the end of March the largest was nearly full grown.

Length about an inch and a quarter, and moderately stout in proportion: head narrower than the second segment, into which it can be partially withdrawn; it has the face flat, and there is a slight depression on the crown. Body of nearly uniform width throughout, and cylindrical; the segments overlapping each other however, and each being divided into sections by transverse ribs, together with a somewhat prominent ridge along the spiracles, give it a rather uneven appearance; the anal segment ends in a rather sharp triangular appendage, and the anal legs, being set widely apart, are very conspicuous: skin smooth, but tough in texture.

Ground colour uniformly pale stone-grey; head of the same colour, with a dark crescentic mark surmounting each mandible, and another dark brown crescentic mark above these; the mandibles are brown, of a still darker shade. A double, very dark brown, almost black, line extends through the dorsal area; on the anterior segments it is paler and more uniform, but after it reaches the fifth it becomes swollen and darker in the middle of each segment, which gives it a conspicuous and rather interrupted appearance; sub-dorsal and spiracular lines pale grey, the latter rather prettily edged above and below with chocolate-brown, the brown being most noticeable on the anterior segments: the spiracles, and four very distinct dots on the dorsal area on each segment, intensely black.

Ground colour of the ventral surface of a yellower-grey than the dorsal area; it has a broad central pale grey band, enclosing a fine double reddish-brown line; outside the band, but adjoining it, on segments 6, 7, 8, 9, and 10, is a conspicuous dark smoky mark; and between the central band and the spiracular region is another faint pale line.

About the middle of April the first went below the surface, and the moths emerged at the end of July.—Geo. T. Porritt, Highroyd House, Huddersfield: *October 4th, 1878.*

Larva of Acidalia imitaria.—I used to find the larvæ of *Acidalia imitaria* feeding on privet (*Ligustrum vulgare*); they seemed to affect the lower twigs, quite near the ground.—R. South, 277, Camden Road, N.W.: *October*, 1878.

Vegetable Moth-trap.—Seeing a notice in this month's Magazine of the vegetable moth-trap, I send you a specimen. Though this moth was dead when I took it from the climber, as a rule they are alive and apparently uninjured the morning after their capture, and I have released as many as eighteen *Plusia gamma* from one plant of a morning. The sensitive portion of the flower appears to be quite at the base, closing, when touched by the proboscis of the victim, and holding it there like a vice. Charles R. Digby, Studland Rectory, Wareham, Dorset: *October 9th*, 1878.

[The example of *Plusia gamma* sent by our correspondent, caught by a flower of *Physianthus*, was not dead as he supposed, but was alive and fluttering when the box was opened on the 11th; it was dead the next day. It appears probable that the fertilization of the flowers necessitates the capture of moths. Riley has recorded the same habit in America (Proc. Ac. Sci. St. Louis, vol. iii, p. cxv, Dec. 1st, 1873), and with regard to insects even more powerful than *Macroglossa*. He remarks that when they do escape, it is at the expense of part of their haustella.—Eds.].

Entomological Society of London: *7th August*, 1878.—H. W. Bates, Esq., F.L.S., &c., President, in the Chair.

Mr. McLachlan communicated a note to the effect that the larvæ in the haulm of potatoes, noticed by Professor Westwood at the Meeting of July 3rd, were probably those of *Gortyna flavago*, which is known to feed in the stems of a variety of herbaceous plants.

Mr. S. Stevens exhibited living examples of *Teretrius picipes*, found on palings at Upper Norwood, and parasitic on *Lyctus oblongus*. He also mentioned that Mr. Clark had bred ♂ ♀ of *Pachnobia hyperborea* from pupæ found under stones on the mountains near Rannoch.

Mr. Enock exhibited several remarkable varieties of British *Lepidoptera*.

Mr. Rutherford stated that he had bred the parasite on the larvæ of *Anaphe* exhibited at the Meeting on the 5th June. It proved to be an ichneumon, determined by Mr. F. Smith as *Cryptus formosus*, Brullé, known to be parasitic on *Anaphe reticulata*. He exhibited a series of colour-varieties of *Aterica meleagris*, an African butterfly, as an illustration of protective resemblance, the colours varying according to the nature of the soil in the districts frequented by the insect.

Mr. Jenner Weir thought the colour-variations of *Hipparchia Semele* might be attributable to the same cause. Mr. Elwes was of opinion that too much stress was attached to so-called protective resemblances. Mr. Distant and the President also took part in the discussion.

Mr. Jenner Weir exhibited varieties of *Argynnis Paphia*, captured this year in the New Forest, the most interesting being males, which, from their dark coloration, showed a tendency toward the ♀ variety known as *valezina*, and he was of opinion that they were potentially males of this form. He remarked that although the species was much less common than usual this year, the numbers of *valezina* were proportionately greater.

Prof. Wood-Mason read a paper on the difference between the form of the antennæ in the males of *Idolomorpha* and other genera of *Empusidæ (Mantidæ)*.

Mr. Dunning read a paper on the genus *Acentropus*.

Mr. Butler communicated descriptions of several new species of *Myriopoda* of the genera *Sphærotherium* and *Zephronia*.

Mr. Baly sent descriptions of new genera and species of South American *Eumolpidæ*.

4th September, 1878.—F. SMITH, Esq., Vice-President, in the Chair.

David Price, Esq., of Horsham, was elected a Member, and Captain Thomas Broun, of Auckland, New Zealand, a Subscriber.

Mr. Rutherford exhibited two specimens of an Orthopterous insect (*Palophus Centaurus*, Westwood) from Mount Camaroons, remarkable for its nocturnal habits, and for the perfect resemblance shown between it and the twigs of the tree it frequents.

Mr. Meldola stated that he had remarked, in *Hipparchia Semele*, an amount of protective resemblance analogous to that noticed at the previous Meeting in the case of *Aterica Meleagris*: specimens of the *Hipparchia* from the sand hills of Lancashire differing perceptibly on the under-side from those of the chalk of the South of England. Mr. Weir remarked that he had been able to detect Jersey specimens of this butterfly which had been mixed with ordinary British examples. Mr. Boyd alluded to the pale colour of *Hepialus lupulinus* at Margate.

Mr. Smith exhibited a fruit of the "Locust tree" of British Guiana, which was found to contain living specimens of a weevil (*Cryptorhynchus stigma*, Linn.), and a small ichneumon. He also exhibited a specimen of *Melolontha vulgaris* found recently in the perfect state in a box in which a larva had been placed last April.

Mr. Champion exhibited a series of *Spercheus emarginatus* from West Ham.

Mr. Spiller exhibited a collection of so-called "jumping seeds" from Mexico, containing larvæ of *Carpocapsa saltitans*.

The Secretary exhibited a photograph of *Prodryas Persephone*, Scudder, a fossil butterfly of the tertiaries of Colorado, which showed a remarkable degree of preservation.

Mr. F. Smith stated that having recently had occasion to consult the Linnean collection of insects, he found that it had been allowed to fall into a state of complete neglect, and that after having consulted the Council of this Society, he proposed that immediate steps be taken to remedy such a state of affairs, which was agreed to unanimously.

Mr. Swinton communicated a paper "On the vocal and instrumental music of insects."

Mr. C. O. Waterhouse read a paper on *Coleoptera* from Jamaica and other islands of the West Indies.

2nd October, 1878.—H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

Mr. J. L. Hamilton, M.R.C.S., of 34, Gloucester Terrace, Hyde Park, was elected a Subscriber, and Mr. T. Nottidge, of Ashford, a Member.

Mr. F. Smith stated that he had communicated with Sir J. Lubbock, who, in his turn, had written to the President of the Linnean Society, respecting the state of the Linnean Collection of insects, and had received an assurance that its preservation should be attended to.

Mr. McLachlan read a statement on the condition of the so-called Linnean Collection and its present scientific value. He expressed his surprise that Mr. Smith should have taken the course he had done, instead of first communicating privately with the Officers of the Linnean Society, who are responsible for the safety of the Collection. The opinion that it had been allowed to fall into a state of complete neglect was so contrary to Mr. McLachlan's own experience from frequent examinations during a period of fifteen years, as to induce him to make an independent inspection two days previously. He found nothing whatever to justify Mr. Smith's statement or the course taken by the Society. There were no traces of mites, *Psoci*, or *Anthreni*, and in fact nothing but a few traces of mould, probably the result of some former neglect. He did not consider the collection of any special importance, owing to the treatment it had received before it came into the possession of the Linnean Society, and any value it now had, could only exist if it be maintained in connection with Linné's annotated copies of his own (and other) works in his library.

Mr. Stainton said he had examined the collection the previous day, and found those portions of it in which he was specially interested in the same condition as when he first consulted them thirty years ago. If Mr. Smith was of the opinion he stated to the Meeting on the 4th ulto., he did right in bringing the matter under the notice of the Linnean Society.

Mr. Jenner Weir exhibited specimens of *Hipparchia Semele* from the New Forest, Lewes, the Righi, and Russia, in illustration of the variation on the underside mentioned at the previous Meeting.

Mr. McLachlan exhibited the eggs and young larvæ of *Ascalaphus longicornis*, found by M. E. L. Ragonot in the Forest of Lardy near Paris; the eggs were arranged (as usual) in two rows on a grass stem, to the number of twenty-three in each row. He also exhibited (on behalf of Mr. Edwin Birchall) the specimen of *Heliothis scutosa* captured in Ireland by Mr. Campbell, and recorded in the present No. of this Magazine.

Mr. Champion exhibited specimens of *Amara infima* from Chobham.

Mr. W. A. Forbes exhibited a collection of insects from the neighbourhood of Chamounix, captured at an elevation of 5—6000 feet.

Mr. Rutherford read the description of a new species of Goliath beetle (which was exhibited) from West Africa, which he proposed to call *Ceratorrhina Batesi*. He also exhibited an example of *Rhomaleosoma Ruspina*, nearly a third of the wings of which (on both surfaces) was hyaline, and considered it had been bred in that condition.

Prof. Wood-Mason read notes on the hatching period of *Mantidæ* in East Bengal, and on the discovery of a stridulating apparatus in this family of *Orthoptera*, consisting of the serrated margin of the tegmina. He stated that he had discovered an instance of viviparity in the *Orthoptera* in *Panesthia javanica* (*Blattidæ*), from *the abdomen of* a ♀ of which he had extracted young insects, proving that in this *case there is no egg*-capsule.

NOTES ON BRITISH *TORTRICES.*

BY CHAS. G. BARRETT.

(*Continued from Vol.* xiv, *p.* 241).

In former notes (vol. xiii, p. 159), I stated that *Eupœcilia hybridella* had been reared by Mr. Thos. Wilkinson, of Scarborough, from seed-heads of sow-thistle (the printer made it *cow*-thistle)—*Sonchus oleraceus.* Upon this, my friend, Mr. W. R. Jeffrey, pointed out to me that the occurrence of the larvæ of this species (under the name of *carduana*) "upon one of the *Hieracea*" had been recorded by him in the Entomologist's Weekly Intelligencer, vol. viii, p. 124, and he expressed a decided opinion that the food-plant of this species was not a *Sonchus.* By good fortune I found a few seed-heads of the plant which had been sent me with larvæ by Mr. Wilkinson, and these, on examination, proved to belong to *Picris hieracioides.* Following the clue so fortunately obtained, I searched the seed-heads of *Picris hieracioides* in the quarries late in September, 1877, and succeeded in finding in them a very few full-fed larvæ, from one of which I reared a most lovely imago on July 17th of this year. In the quarries, however, the moth was out a week or two earlier, and on July 27th I found plenty of young larvæ in the *Picris* heads. By the middle of August most of them were full-fed, but a few might still be found till late in September.

The young larvæ are of a buff colour, but when full grown pale pink, whitish beneath, sufficiently transparent to render the internal dorsal vessel visible. Head light brown, jaws black, dorsal plate yellowish with a chain of four black dots across it, anal plate light brown. In form it is short and stumpy, thickest in the middle, but moderately active and immoderately restless and impatient of confinement.

It feeds on the seeds of the *Picris,* lying concealed in the seed-head, and passes freely to a fresh head when necessary, but without uniting them together or spinning any web. When full-fed, it leaves the seed-head and spins a tough cocoon, probably among rubbish or rotten wood, but it is difficult to manage in confinement, biting its way remorselessly through almost any covering.

I have not yet seen the pupa. That state is probably assumed about June.

Eupœcilia atricapitana, Steph.—I am aware that this species has already been reared by Mr. Howard Vaughan and others from ragwort, but I have seen no account of its habits. I found larvæ in the ragwort plants, on one of the slopes of the coast sand-hills, rather commonly on July 15th, and they continued to feed until the end of July, producing the second brood of moths in August, but so terribly were they infested with ichneumons that, although I brought home two large bundles of plants and planted them in flower-pots, only six specimens emerged. This accounts for the scarcity of the moth along this coast.

The larva is short and thick, thickest towards the head and rather attenuated behind, somewhat wrinkled and excessively sluggish—not to say stupid,—dull pale yellow, faintly tinged with reddish on the back, spiracles brown, head light brown, plates faintly brownish, the dorsal plate having a brown bar across its posterior margin. Abdominal legs very small and inconspicuous.

Feeding within the growing stems of *Senecio jacobæa*, eating the pith and stopping the growth of the central shoot so that it becomes thickened and covered with a bunch of leaves, while the side-shoots grow up past it. From appearances, the larva must commence to feed in the heart of the shoot and eat down into the pith of the stem where it forms a chamber, in which it assumes the pupa state in a cocoon of white silk. The pupa is of a light chestnut colour, and is extruded from the burrow when the moth emerges. This habit of assuming the pupa state *in the feeding place* is very unusual in this group.

I have not yet met with the second brood of larvæ from which the early summer brood of moths is produced.

Dr. Hofmann quotes from Gartner to the effect that the larva of *atricapitana* feeds "in October in the root-stocks of *Hieracium umbellatum* either on the surface of the root, covered with a web, or in a " silken tube within, several larvæ not unfrequently being together."

But I think this must refer to some other species. Certainly the insect shows no partiality for *Hieracium umbellatum* in this country, but is always found among ragwort.

Eupœcilia angustana, Steph.—I hear from Mr. Jeffrey that he once reared this species from pink larvæ found in the seed-heads of *Plantago lanceolata*, on the cliffs of Scarborough, in the first week in September. This partly agrees with Gartner's account (under the name of *cruentana*),—"Not unlike the larva of *dubitana*, the anterior margin of the " dorsal plate not whitish, but like the head, dark brown, and the elevated dots on the back not so conspicuous. In August, among the " seeds of *Plantago media*, in an ascending web. Pupa short, dark " brown, shining." (*Dubitana*, he describes, "brownish-yellow, naked, " with isolated short hairs. Head heart-shaped, flat, rust-yellow; "*dorsal plate bistre*-brown, lighter in front, edged and divided with "pale)." Probably the discrepancy in colour arises from the *age* of the larva described. The other food plants of *angustana* mentioned are flowers of *Achillea* and *Origanum*, and no light is yet thrown upon the food plant or larva of the (supposed) second brood of this species found abundantly on heaths where the (supposed) first brood is never seen!

Eupœcilia curvistrigana, Wilk.—Larva short and rather stumpy, thickest in the middle, not active, pale yellowish-pink, but deeper pink when full grown, with grey internal dorsal vessel; hairs very delicate, spiracles pink. Head light brown, eyes and jaws blackish, plates pale amber colour. In flowers of *Solidago virgaurea*, eating out the young seeds and passing from flower to flower, sometimes uniting them slightly with silk. When full grown, leaving the flowers and spinning a tough cocoon among rubbish or rotten wood.

I found larvæ in September of last year, but failed to rear them. This autumn I have a good number, with which I hope for better success. Mr. Machin has reared a few specimens annually for the last few years, but finds them very scarce.

Eupœcilia affinitana, Doug.—This species was reared from flowers of *Aster tripolium* by Von Heinemann some years ago, and since by several English entomologists, but I am not aware that any description of the larva has been published. It is stumpy, sluggish, dirty whitish, faintly tinged on the back with grey, through which the dorsal line is visible, and with a faint grey spiracular line. Head brown, dorsal plate black, anal plate pale brown. In blossoms and seed-heads of *Aster tripolium*, eating out the young seeds and doubtless moving to a fresh head when the food is exhausted, and quitting the seed-heads to spin up. As its food plant is apt to be submerged at high spring tides, it must either travel some distance to spin up, or make a cocoon which enables it to set salt water at defiance. I found a few larvæ at the end of September last year, and reared two specimens in July last. At the end of July I found larvæ, from which I expected to rear a second brood in August, but was disappointed, and suppose they are lying over until next spring. I cannot blame them for this, for the weather last August in this neighbourhood was not attractive.

Eupœcilia implicitana, H.-S.—The food plants of this species have already been recorded by several writers, but my friend, Mr. W. West, of Greenwich, has supplied me with so interesting an account of the habits of its larva, that I make no apology for reproducing his observations. He says, "The food is the common chamomile (*Pyrethrum* "*inodorum*); the larvæ feed in the seed-heads and also in the stems, "eating their way in from the joints. I have examined hundreds of "joints, and find that about an inch is sufficient for each larva. They "are to be found very small (I have seen them feeding when very "minute) as well as full-fed in the stems, and pupate in them and in "the seed-heads. I have seen five or six pupa-skins sticking out of "the joints of a single plant. In June, when the first brood of larvæ "is feeding in the stems, there are no seed-heads, but I found them in "seed-heads *and stems* in August, and again in October. The larvæ of "this last brood hibernate. I put three larvæ into a chip box and they "remained in that state under a web until May 5th, then changed to "pupæ, and emerged about the 20th. I also found two larvæ on the "18th searching for a comfortable place to change in. There are three "broods—the moths appearing in May, July, and September, and these "three broods do not differ, but there is exactly the same variation in "size and colour in each."

Mr. West kindly sent me larvæ two years ago, from which I noted the following description: "When young, dull greenish with a black "head, but when full grown, pale yellow, with light brown head, and "with two black dots at the posterior margin of the yellowish dorsal "plate. Eating round the seed-heads of *Pyrethrum inodorum*, devouring "the seeds and also boring into the joints of the stem, which they hol- "low out, going into pupa in the spaces."

But Dr. Hofmann describes the larva as follows: "Yellow, with "shining black head, dorsal plate brown, posteriorly black; anterior "legs black, ventral and anal pro-legs yellow-brown, the latter with "a light brown horny plate; raised dots yellowish with very fine white "bristles. In autumn, in the seeds of *Chrysocoma linosyris*; according "to Rössler, on *Gnaphalium* and *Solidago*; according to Zeller, on "*Pyrethrum*. (The food plants are, at any rate, exclusively *Compositæ*)."

It certainly is found also in this country among *Solidago*, and Mr. Machin has once reared it from that plant.

Rössler, I believe, adds that it flies among *Artemisia campestris* and *vulgaris*, *Gnaphalium* and *Tanacetum*, and Heinemann that it feeds in seed-heads of *Anthemis cotula*, which, if correct, would identify it with Curtis's *anthemidana*, with his description of which the *female* of this species closely agrees. In this view I see that I am corroborated by Heinemann himself.

Eupœcilia roseana, Haw.—Wilkinson, after describing the larva of this species pretty accurately, says, "before attaining its full dimen- "*sions it eats its* way into the centre of the teazle-head, spinning a "silken web over the entrance, it there feeds on the pith, and goes "into pupa at the top of the stem, first spinning a loose white "silken web."

This is surely an error! The loose white silken web is that of the larva of *Penthina gentianana!* As far as my observations go the larva feeds transversely through the seeds of the teazle until full-fed, then makes a tough cocoon in the hollowed seeds, and when the moth emerges the pupa-skin is drawn out among the spines at the side of the seed-head.

Cochylis straminea, Haw.—On July 25th, I found larvæ of this species inhabiting the base of the flower-heads of *Centaurea nigra*, eating the young seeds and lying curved in the cavity formed, or when disturbed (particularly if young) retreating into the thickened portion of the stem immediately beneath, the pith of which seems to have formed their first food, and in the side of which was a hole for the extrusion of frass. These larvæ when full grown are very sluggish and plump, thickest in the middle, rather shining, very pale yellowish, or almost white, with faintly grey internal dorsal vessel. Head deeply lobed at the back, black, dorsal plate brown, divided and narrowed at the sides so as to form triangles, anal plate light brown, anterior legs black. When young, however, the head and dorsal plate are dark brown and without lobes or divisions. When the larva is removed from the flower-head it stands with its anterior segments raised, and head turned with a most comical look of surprise and attention.

These larvæ produced moths in August, the May and June brood being in the larva-state in September.

The larva of this species must be tolerably well known, but I have been particular in describing it in order to compare it with that of the next species, which has sometimes been looked upon as doubtfully distinct.

Cochylis alternana, Steph. (*gigantana*, D. & S.).—For this species I am indebted to Mr. Howard Vaughan, who sent me five buds of *Centaurea scabiosa*, each containing a larva, in the beginning of July. These were short and thick—obese in fact—and very sluggish, pale yellow, with the spots small and black; head chestnut-brown, dorsal plate black-brown, divided by a yellow line in the middle, anal plate dark brown, very small. In buds of *Centaurea scabiosa*, eating out the immature seeds and almost the whole contents of the bud, and surrounding themselves with a tough silken tube or pouch as they fed. In this pouch they assumed the pupa-state within the buds. I supplied fresh buds, but *not one of the larvæ* touched them; those in which they reached me contained sufficient nutriment to enable them to feed up, but I cannot think that one bud would serve a larva for its entire growth. The moths emerged at the end of July; the pupa, which is of a dark chestnut, being then extruded from the bud.

The insect is only found (with us) in the south-eastern corner of England, and I have had no opportunity of observing it at large; but, as far as I can learn, there is only *one* brood, which is on the wing as nearly as possible between the two broods of *straminea.*

Coccyx Ochsenheimeriana, Zeller.—In the latter part of last May, Lord Walsingham met with several specimens of a very beautiful little *Coccyx*—allied to *strobilella*, but smaller—among *Pinus cephalonica* at Merton. The species was then quite unknown to me, but, by the kindness of Professor Zeller, I have since been able to identify it as *Ochsenheimeriana*, Zeller. A short description may be useful:—

Al. exp., 4½ lines. Head, palpi, and antennæ black, thorax and abdomen smoky-black. Ground colour of fore-wings *apparently* dark olive-grey, but *actually* black, closely irrorated with minute yellow scales. The greater part of the costal margin occupied by seven black spots, within each intermediate space a short, bright silvery streak. Outer edge of the usual basal blotch indicated by a nearly straight, oblique, faintly blackish fascia. Central fascia deep black, arising at the third costal black spot and bending outwards, and then, while still near the costa, turning across the wing *perpendicularly* to the dorsal margin. This fascia is edged on both sides with bright silvery. Before the hind margin is a black, perpendicular streak, edged with silvery, and occupying the place of the usual ocellus. Apical spot black. Cilia extremely glossy, silvery-black, but with a deep black line at the base. Hind-wings dark grey, with slightly paler cilia.

Although resembling *strobilella,* this species is easily distinguished from it by its much shorter fore-wings, and the absence of most of the silvery transverse lines, but more especially by the strongly marked central fascia, *perpendicular to the dorsal margin.* In *strobilella* the central fascia is angulated in the middle.

Wocke gives as its localities, "Germany and Livonia," and the type sent me by Prof. Zeller is from the latter country; but, according to Heinemann, it is found at Vienna, Bohemia, Ratisbon, and Brunswick in May and June, among *Pinus picea,* and also in woods in which there is no fir. But I am not very sure that Heinemann's remarks really refer to this species, for besides other discrepancies, he describes the palpi as *whitish,* whereas they are black, or nearly so.

Nothing appears to be known of its larva, and Lord Walsingham has not as yet found any probable trace of it. No doubt it has been *introduced into this* country with ornamental trees, and I hope that it has effected a permanent settlement in his lordship's woods. I am indebted to his kindness for specimens, and for the opportunity of recording this beautiful little novelty.

Orthotænia striana, Schiffermiller.—On the 19th of March last, having an hour to spare, and a fern-scoop at hand, and being close to a large field of old pasture abounding, in the summer, in *Dicrorampha* and other *Tortrices*, I determined to devote the time to promiscuous digging for root-feeding larvæ. Accordingly, all manner of plants were turned up—thistles, plantains, ragweed, knapweed, hawkbit, hawkweed, *everything* that could boast a substantial root, even to the common dandelion, and before long, to my great surprise, I found a small larva burrowing into the skin of the root of the last-named and most despised of plants, the common dandelion (*Leontodon taraxacum*). This larva was so small that I hoped it might produce *Dicrorampha sequana*, and by digging up hundreds of dandelion roots on this and a subsequent occasion, I succeeded in finding from a dozen to twenty larvæ. Most of them were placed in flower-pots in which bunches of the dandelion plants dug up in the search were placed and tied over with gauze, but that no chance of rearing them might be lost, I put one larva into a tin box with some bits of root, sufficient, as I supposed, for it to feed up on, and it was no more visible until May 8th, when I was astonished to find a plump active larva more than half an inch long in the box, where, having hollowed out its stock of roots, it was eagerly hunting for more. More were supplied, and it was placed in a glass-covered gallipot, when it immediately burrowed into one of the roots, proceeding to show a healthy appetite by the quantity of frass extruded from one end, and by the end of May it was full-fed, and had made a tough cocoon of earth and silk, not attached to the roots. The idea of a *Dicrorampha* had—from its size—long been given up, and having no idea what was likely to be produced, it will readily be understood that I was not gratified when, on opening the gallipot a few days after, a dipterous parasite (*Tachina*) flew out. However, the dandelions in the flower-pots had not been thriving, and were indeed dying one by one, and on June 30th, from one of them emerged the first specimen of *Orthotænia striana*. A dozen more appeared in the course of a fortnight, some of them—the females especially—being of very pretty reddish and pink varieties.

The larva, when small, is of a dirty whitish colour, with a large, dark grey, internal dorsal vessel, very visible, head light brown, plates both very pale brown. At this time it feeds at the surface of the *dandelion root, burrowing* under the skin, and protecting itself with a slight web; when larger, it becomes of a more yellowish-white, and burrows *into* the substance of the root, hollowing it out and killing the plant. The favourite place of pupation in the case of healthy larvæ, appears to be the upper end of the hollowed root, close under the dead crown, through which the light brown pupa is pushed when the moth emerges.

I am not aware that the larva of this species has before been noticed, but I am inclined to suspect that it feeds also on the roots of allied plants, for I remember once finding both sexes in abundance in a field at Norwich, in which some composite plant, which I did not recognize (probably *Crepis* or *Borkhausia*), was growing in plenty. The moths, the females especially, constantly settled upon these plants, and I have no doubt that as larvæ they had fed in the roots.

Orthotænia antiquana, Hübner.—I think that I have already recorded finding this species with *O. ericetana*, Westw. (*trifoliana*, H.-S.), and *Euchromia purpurana*, commonly in some of the clover fields here. The larvæ of the last two species being quite unknown (for Möschler's record of *ericetana* "on aspen," is obviously incredible), I took the opportunity, when one of these fields was ploughed up in February, of examining every root that I could find exposed by the plough. Scattered commonly over the field were pieces of what might be called long thin tuber, rather than root, since they were fleshy and brittle, without internal fibre, and totally devoid of fibrous roots or attachment to any kind of stem. They were of about the thickness of a goose quill, eight or ten inches long, rounded off at the ends, and regularly *constricted* at about every inch of their length. These roots (or tubers) were quite strange to me, but I soon found that many of them were tenanted by a slender larva which moved rapidly up and down a burrow exactly in the middle of the root, and extending to nearly its entire length. The burrow of a young larva was small and regular in width, but when larger they hollowed out one end of the root and caused it partially to decay. I collected a lot of these roots and laid them with mould in a large garden-pot tied down with gauze. In the spring these roots or tubers sent down plenty of fibrous roots into the earth, and threw up shoots which soon declared themselves to be *Stachys arvensis*, and made the identity of the larvæ pretty certain. They fed up entirely in the roots—apparently without affecting the vitality of the plants—and were full-fed about June 10th, when they deserted the roots to spin up in moss, hollow sticks, rolled paper, between a leaf and the side of the pot, anywhere in fact that was dry and convenient, and on June 28th, the first specimen of *antiquana* emerged, others appearing for more than a fortnight afterwards.

When young, the larva is rather slender and long, white, with a faint yellowish tinge, dorsal line slightly darker and very narrow, dorsal vessel visible, slender also. Head clear light brown, its two halves oval, plates hardly visible, very faintly tinged with brown. Altogether an unusually clear, white looking larva. In the middle of April, when nearly full grown, three quarters of an inch long, clear, shining, yellowish-white or creamy, with a quadrate pink internal spot, visible through the skin of the 9th segment, head and dorsal plate light brown, anal plate grey. Pupa light brown, very restless.

Perhaps I should apologize for going so much into detail respecting a larva which has repeatedly been reared before, which is described and its food given by Mr. Stainton, in the "Manual," in about ten words, and which has been more particularly described by Colonel Goureau in the Ann. Soc. Ent. Fr., 1851, p. 323, but its habits are so peculiar that they interested me very much. It seems reasonable to conclude that the eggs are laid on the stems of the food-plant, and that the young larvæ mine down them into the roots, but no trace of the place of entrance is discernible.

Finally, as an encouragement to further effort, one specimen of *O. ericetana* actually emerged from the same pot. Its larva must have fed in the same roots, there being no other plant in the pot.

Pembroke: *9th October*, 1878.

DESCRIPTION OF THE LARVA OF *EUPŒCILIA MACULOSANA*, AND ITS HABITS.

BY JOHN H. WOOD, M.B.

On several occasions I had found when opening the dry stems of *Umbelliferæ*, in the winter, a larva, from which I had bred *Eupœcilia maculosana.* The larva always occupied a short gallery, or rather chamber, in the pith, and the limited amount of frass present, as well as the absence of extensive workings, showed that it must have fed up elsewhere; but where that was, remained a puzzle till the summer of 1876.

I was collecting *Tortrices* in a moist place in one of the woods here, one afternoon in the month of June, and had boxed such insects as *P. fuligana*, *S. euphorbiana*, *S. puncticostana*, &c., when I saw a specimen of *E. maculosana* alight on a seed-vessel of the common blue-bell (*Agraphis nutans*), and apparently deposit an egg. It then flew to another plant, and so on to another. I was unable to follow up the clue that season, but the following July, towards the end of the month, I found the full grown larvæ feeding not uncommonly on the seeds of this plant. It was necessary to open the vessels to find them, as the larvæ gave no outward indication of their presence, excepting in the rare instances, when a larva, having exhausted one vessel, had entered a second, in which case the point of entrance, though closed as it always was with silk, was easy to see. Usually it finds food enough in a single vessel, and makes no visible communication with the outside, till it becomes full-fed and eats its way out to go in search of winter quarters. My own larvæ were supplied for this purpose with cork and dead bramble-shoots, into which they readily burrowed, or rather, I should say, ate, for they swallowed the removed material, and did not simply turn it out, as most larvæ do under similar circumstances. Probably this is merely an expeditious way of getting rid of the refuse material, for it can scarcely be that it is swallowed as food, since the chamber is completed in a very few days and then all production of frass ceases. At any rate, it is a curious feature in its œconomy, and I can call to mind no other larva that acts in the same way.

The markings of the larva are unusually distinct and abundant for an internal feeder. The colour of the body is white; that of the head pale brown. There is a black plate on the 2nd segment, and another on the 13th. The dorsal and spiracular lines are pale rust-colour, and well marked. The usual spots are also of the same colour, and distinct. There is no sub-dorsal line, but below the spiracular line are two other rust-colour lines, the lower one running along the base of the legs and claspers. Both these lines are interrupted, and are also paler in tint than the dorsal and spiracular ones. The larva, when full-fed, eats, as has been said, into some soft woody substance, and there remains till the spring, when it assumes the pupal-state.

Tarrington, Herefordshire:
26th October, 1878.

Autumnal pupation of Abraxas grossulariata.—As I have never seen any reference to the above subject in any books which have come under my notice, I venture to forward you a few remarks, which you will perhaps think interesting enough to publish. In November, last year, I found, in a friend's garden near London, about seven dozen pupæ of this species on some old gooseberry and currant bushes. I at first thought they were old and empty, but, on pulling one or two off, found them fresh and alive. I tried to rear them, but unsuccessfully. In October this year I found, in the same garden, altogether about forty dozen, and also the larvæ in all sizes, from a quarter of an inch in length to some actually spinning up. The imago has been reared freely from the pupæ taken this year.—H. SILCOCK, 22, *Randolph Street*, Camden Town, N.W., and West London Entomological Society: *November, 1878.*

DESCRIPTIONS OF SIX NEW BUTTERFLIES.

BY THE LATE W. C. HEWITSON, F.L.S.

[I have been asked to publish the following descriptions of new species, which were found among Mr. Hewitson's papers after his death, and the types of which are in his collection.—W. F. Kirby, Dublin: *September* 11*th*, 1878.]

EUREMA CHARON.

Upper-side: male, dark brown, paler towards the outer margins. Anterior wing with two white spots beyond the middle of the costal margin, the spot nearest the apex bifid. Posterior wing with one triangular tail, and a sub-marginal series of black spots.

Under-side: red-brown, variegated with paler spots. Both wings crossed at the middle by a band of dark brown. Anterior wing with two yellow spots in the cell, one at the base triangular, marked by a brown spot, the other at the end, marked by an eye-like brown spot; a yellow spot on the costal margin beyond the middle, marked by a rufous spot, the apex rufous-orange, crossed by three brown spots. A sub-marginal series of lilac spots. Posterior wing with six yellow spots from the base to the middle of the costal margin, and a rufous eye-like spot, some rufous spots towards the inner margin, a sub-marginal series of indistinct ocelli, and some lunular blue spots between the tail and anal angle. Exp. 2 inches.

Hab.: Ecuador (Buckley).

LEUCOCHITONEA LATHÆA.

Alis supra rufo-fuscis fasciis duabus transversis, marginibusque exterioribus fuscis. Anticis macula atra discali punctis duobus albis notatis. Posticis infra cæruleis.

Upper-side: rufous-brown. Both wings crossed beyond the middle by two bands of brown, both with the outer margin dark brown, and the fringe broadly brown. Anterior wing with the base dark brown. A large, oval, black discal spot (as in *Mesosemia*), marked by two minute white spots, and bordered with rufous: a brown band below it to the sub-median nervure. Posterior wing with the base and a band below it dark brown.

Under-side: anterior wing as above, but paler, with the base slightly tinted with blue. Posterior wing pale blue to the second transverse band, and marked by some indistinct grey spots in the place of the first band. Exp. $1\frac{1}{10}$ inch.

Hab.: Bolivia (Buckley).

LEUCOCHITONEA LYRCÆA.

Alis supra fuscis, marginem exteriorem versus rufis, fasciis duabus *marginibusque fuscis. Anticis macula discali nigra, punctis binis albis notata. Posticis infra albis, cæruleo-tinctis, margine costali fasciis duabus, ciliaque rufo-fuscis.*

Upper-side: brown, rufous towards the outer margin. Both wings with two transverse bands and the outer margin dark brown. Anterior wing with a black cordate spot at the end of the cell, marked by two minute white spots, and bordered by paler colour: an indistinct brown band below this to the sub-median nervure. Posterior wing with an indistinct brown band before the middle.

Under-side: anterior wing as above, except that it is paler at the inner margin. Posterior wing white, tinted with pale blue, crossed from the costal margin, which is clouded with brown, by several bands of brown, two short ones near the base, one near the middle, and one sub-marginal; the outer margins also brown.
Exp. $1\frac{3}{10}$ inch.

LEUCOCHITONEA EARINA.

Alis utrinque fuscis, versus marginem exteriorem rufis: fasciis duabus fuscis. Anticis macula discali nigra, punctis binis albis notata. Posticis infra angulum analem pallidioribus macula fusca notatis.

Upper-side: dark brown, rufous towards the outer margin. Both wings with two transverse bands, and the outer margin dark brown. Anterior wing with an oval black spot at the end of the cell, marked by two minute white spots, and bordered at both ends with paler colour.

Under-side: as above, except that the transverse bands are divided into spots, that the posterior wing is paler near the anal angle, and is there marked by a large black spot. Exp. $1\frac{3}{20}$ inch.

Hab.: Para (Bates).

LEUCOCHITONEA ELELEA.

Alis supra fuscis, fasciis duabus marginibusque fuscis obscurioribus. Anticis macula discali nigra punctis binis notatis. Posticis infra cæruleis, apice margineque posteriori fuscis.

Upper-side: dark brown, paler towards the outer margin. Both wings with two transverse bands, which are below the middle, and the outer margin dark brown. Anterior wing with an oval black spot at the end of the cell, marked by two minute white spots, and bordered inwardly with paler colour; an indistinct band of brown below it. Posterior wing crossed at the middle by an indistinct band of brown.

Under-side: anterior wing as above, except that it is paler towards the anal angle, and slightly tinted with blue at the base. Posterior wing bright cerulean blue, darker where the bands of the upper-side cross; the apex marked by a black spot, and the fringe dark brown. Exp. $1\frac{1}{4}$ inch.

Hab.: Cayenne.

LEUCOCHITONEA FALISCA.

Alis supra rufo-fuscis, fasciis duabus fuscis (posticis tribus). Anticis macula discali nigra punctis binis notata punctisque tribus sub-apicalibus albis. Infra anticis macula anali flava; posticis flavis margine costali fasciisque duabus fuscis: macula anali nigra.

Upper-side: dark brown. Both wings crossed beyond the middle by two dark brown bands, the second, which is sub-marginal, divided into spots. Anterior wing with a round black spot at the end of the cell, marked by two minute white spots, and bordered with paler colour: three minute white spots near the apex upon the first transverse band, and below them upon the same band, one very minute spot. Posterior wing crossed before the middle by a brown band.

Under-side: anterior wing as above, except that there is an ochreous spot near the anal angle. Posterior wing yellow, with some spots near the costal margin, an indistinct transverse band below the middle, and the outer margin brown. A sub-marginal series of very indistinct spots, and a black spot near the anal angle.

Exp. 1$\frac{3}{10}$ inch.

Hab.: Cayenne.

Allied to *Paulinus*, Cram. The five species which I have decribed above are very much alike, and all have the discal black spot of the anterior wing dotted with white, as in the genus *Mesosemia*.

[There are three other specimens in the collection, without locality, which only differ from the type in having the hind-wings clay-colour beneath, instead of yellow.—W. F. K.]

[N.B.—*Ithomia Lerida*, Hew. This name is attached in Mr. Hewitson's collection to the insect figured by him in Exotic Butt., v, *Ith.*, pl. 30, fig. 199, as *I. Ilerdina var.* The specimens are labelled Ecuador and Nauta.—W. F. K.]

DESCRIPTION OF A NEW SPECIES OF *HELIOCOPRIS.*

BY D. SHARP, M.B.

I have for some years been acquainted with a male of a species of *Heliocopris* of great size, being myself in possession of portions of an individual found by Mouhot in Laos, and having received from C. M. Wakefield, Esq., an individual obtained from the collection of the late Achille Deyrolle. As I have recently obtained a series of specimens from the collection of the late Andrew Murray, I am now enabled to make known the sexes and extreme developments of the species. Mr. Murray's specimens bore no label of any kind, but were placed in one of his boxes of Indo-Malayan *Copridæ*. The specimen in Deyrolle's collection was labelled "*Maclellandi*, Westw., Cochin China," but the species does not appear to have been described, so that I give below a description of it. Its nearest ally is no doubt the Assamese *Heliocopris domina*, Bates, and the two species appear to be of about the same size: the largely developed male of *Heliocopris domina* is, however, described as possessing four horns on the head, to be less black in colour, and to have the intervals on the elytra sub-convex.

In connection with the description of this remarkable insect, I may be permitted to mention what has long been a favourite theory of mine, viz., that as we proceed from the lower to the higher forms in some of the groups of Lamellicorns, we find a better construction of the skeleton, causing the parts of the body to be much more accurately adapted to one another, and that, as the result of this perfection, there is a much greater immunity from the attacks of minute parasites. *Geotrupes* is a form in which the construction is very imperfect, and the result is that the species are dreadfully subject to the attacks of *Acari*, which not only overrun the individuals outwardly, but obtain access to the soft parts of the body, and no doubt destroy a vast number of individuals; to so great an extent is this the case, that I believe the species of *Geotrupes* only continue to exist because the more perfectly constructed Coprophagous Lamellicorns are yet only adapted for existence in warm climates, and *Geotrupes*, therefore, finds in temperate latitudes an abundant and comparatively uncontested pabulum, which enables it at present to hold its place, notwithstanding other disadvantages.

The species of *Heliocopris* offer a beautiful example of the accurate coadaptation of the external parts, by which is obtained a nearly complete exclusion of parasites from those parts of the body which are most accessible in less perfected Coprophagous Lamellicorns; the elytra in *Heliocopris* are so beautifully adapted to the mesothorax, metathorax, and ventral and dorsal segments, that not even a minute parasite can obtain access to any of the soft dorsal surfaces of these parts, although, on making an examination of a *Heliocopris*, we should be justified in concluding that it would be very difficult for an *Acarus* to find sustenance on its juices by getting at the soft parts of the body, yet an examination shows that there are still some parts not sufficiently protected, and on these parts it appears the *Acari* still maintain their attacks. As most accessible, we find the very large mouth. The buccal cavity in *Heliocopris* is greatly developed, and formed of unusually soft pieces, and offers abundant facilities for the entrance of a small invader by its large and unprotected orifice. Thus I was not surprised on cleaning the individual of *Heliocopris Mouhotus* from Cochin China to find its mouth tenanted by a colony of a large species of *Acarus*, and I also found some individuals of the same (or an allied) species in the mouth of one of the specimens from Mr. Murray's collection.

Another and much smaller *Acarus* has, moreover, found a less easily visited feeding ground, on (or rather in) the body of *Heliocopris Mouhotus;* this spot is the prothoracic stigmata.

On examining an individual of *Heliocopris Mouhotus*, whose thorax had become separated from the body, in Mr. Murray's collection, I was surprised to find fifty or sixty individuals of a small Acarid attached to each of the two prothoracic stigmata, and, on taking to pieces the other specimens of the gigantic Lamellicorn, I found the corresponding stigmata to be tenanted in a similar manner. No doubt this species of *Acarus*, which is small and very depressed, is able to penetrate between the prosternum and mesosternum just at the extreme anterior part of the middle coxal cavities, for this spot is quite near to the prothoracic stigma, and on a movement of extension of the head and thorax being made by the *Heliocopris*, the Acarid could easily find entrance at the spot I have mentioned. I should not be at all surprised if it be found that this Acarid is a species specialized for this mode of life.

HELIOCOPRIS MOUHOTUS, *n. sp.*

Major; figura H. gigantis (Bates), *multo major, niger, nitidus, subtus rufo-hirsutus; elytris sat crebre punctatis, evidenter striatis, interstitiis haud convexis; prosterno post coxas haud hirsuto; capite magno.*

Mas, major; capite ad oculos haud constricto, lateribus in medio utrinque cornu erecto, lato, apice emarginato, inter cornua simpliciter arcuatim carinato. Prothorace angulis anterioribus leviter prominulis, utrinque anterius lobo prominulo sub-hamato; supra antice longius perpendiculari, medio lamina elongata, sub-horizontali, acuminata; basi utrinque area lævigata. Long. 60—65 *mm.; lat. prothoracis,* 36 *mm.*

Mas, minor; capite ad oculos constricto, sed haud angulato, vertice in medio transversim fortiter elevata, elevatione in medio emarginata. Prothorace prope angulos anteriores haud vel vix angulato, anterius breviter perpendiculari, dorso ante medium carina transversa elongata, medio anterius sub-angulatim prominula; undique fortiter rugoso. Long. 50—54 *mm.; lat. prothoracis,* 29—31 *mm.*

Fem.; capite ad oculos constricto, haud angulato, vertice in medio elevata, trituberculata, tuberculis lateralibus minutis; prothorace prope angulos anteriores haud angulato, anterius breviter perpendiculari, dorso ante medium carina transversa elongata, utrinque sinuata, in medio late rotundato. Long. 54 *mm.; lat. prothoracis,* 31 *mm.*

Hab.: Laos, Cochin China.

Thornhill, Dumfries: September 28th, 1878.

CHARACTERS OF NEW GENERA AND DESCRIPTIONS OF NEW SPECIES OF *GEODEPHAGA* FROM THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

II.

(*Concluded from page* 123).

C. SCARITOIDES, *sp. nov.*

Convexus, nitidus, nigro-æneus, antennis, palpis, pedibusque totis rufo-testaceis; capite mediocri; oculis prominulis; antennis corporis dimidio brevioribus; prothorace sat fortiter transverso rotundatoque, breviter subcordato, obsolete canaliculato, antice leviter emarginato, trans basin sparsim nec fortiter punctato, basi utrinque foveolato, angulis posticis acutis subdentiformibus; elytris oblongo-ovatis, striâ suturali distinctâ integrâ antice distincte punctatâ, cæteris obsoletis (nonnullis exemplis antice obscure adumbratis); humeris subacute productis.

Long. 6—6½ *mm.*

Haleakala, Maui. Not rare at an elevation of 4000—5000 feet.

C. CORDATICOLLIS, *sp. nov.*

Convexus, nitidus, nigro-æneus, plus minusve rufescens, antennarum basi, palpis, pedibusque testaceis; capite mediocri; oculis prominulis; antennis corporis dimidio brevioribus; prothorace sat fortiter transverso, breviter subcordato, leviter canaliculato, antice leviter emarginato, trans basin sparsim punctato, basi utrinque foveolato, angulis posticis acute rectis; elytris ovalibus, striis internis distinctis integris, antice obscure punctatis, externis obsoletis, humeris parum prominulis.

Long. 4½—5 *mm.*

Haleakala, Maui. At an elevation of 4000—5000 feet. Not common.

C. ANGUSTICOLLIS, *sp. nov.*

Subconvexus, subparallelus, subnitidus, piceus, marginibus rufescentibus, antennarum basi, palpis, pedibusque testaceis; capite mediocri; oculis prominulis; antennis corporis dimidio sat brevioribus; prothorace leviter transverso, canaliculato, antice leviter emarginato, trans basin confuse et fortiter rugato punctatoque, lateribus minus fortiter rotundatis, angulis posticis minutis subdentiformibus; elytris elongato-ovalibus, fortiter striatis, striis distincte punctatis, interstitiis planiusculis, humeris sub-erectis. *Long.* 4 *mm.*

Haleakala, Maui. One example at an elevation of 4000 feet.

C. NUBICOLA, *sp. nov.*

Subconvexus, subparallelus, nitidus, rufescens, elytrorum disco late infuscato, antennis palpis pedibusque rufo-testaceis; capite mediocri, oculis prominulis; antennis corporis dimidio plus paulo brevioribus; prothorace transverso, obsolete subcordato, leviter canaliculato, antice leviter emarginato, trans basin confuse rugato punctatoque, lateribus minus fortiter rotundatis, angulis posticis acute dentiformibus; elytris elongatis, subparallelis, thorace parum latioribus, subtiliter striatis, striis (marginem apicemque versus obsoletis) distincte punctatis, interstitiis planis, humeris rotundato-rectis; tibiis anticis intus solito profundius emarginatis. *Long.* 4½ *mm.*

Haleakala, Maui. One example at summit; 10,000 feet.

C. INÆQUALIS, *sp. nov.*

Convexus, opacus, piceo-cupreus, antennarum basi, palpis, pedibus, et thoracis elytrorumque marginibus (plus minusve) testaceis; capite mediocri; oculis parum convexis; antennis corporis dimidio vix brevioribus; prothorace sat fortiter transverso, breviter subcordato, antice parum emarginato, canaliculato, trans basin obscure rugato punctatoque, postice utrinque profunde foveolato, angulis posticis acute rectis, superficie inæquali (fossâ magnâ juxta angulum anticum utrinque impressâ); elytris ovalibus, confuse striatis, totâ superficie ocellis numerosis confuse conspersâ, humeris rotundatis. *Long.* 4½—5 *mm.*

Haleakala, Maui. Elevation, 4000—5000 feet. Scarce.

BLACKBURNIA.

B. FRIGIDA, *sp. nov.*

Minus convexa, nitida, nigra, antennis palpis pedibusque rufis; capite minus elongato, pone oculos fortiter angustato; oculis parum convexis; antennis corporis dimidio plane longioribus; prothorace (longitudine latitudini æquali) canaliculato, a lateribus rotundato, ante medium latiori, nec trans basin quam antice angustiori, basi punctato, utrinque late nec profunde impresso, angulis omnibus subrotundatis; elytris elongato-oblongis, antice latioribus, postice attenuatis, profunde punctato-striatis, interstitiis convexis, humeris rotundatis parum distinctis; corpore subtus haud punctato, suturâ inter segmentum secundum et tertium nec in medio quidem obsoletâ. *Long.* 9½ *mm.*

Haleakala, Maui. One example at an elevation of 10,000 feet.

B. BLAPTOIDES, *sp. nov.*

Subconvexa, picea, nitida, antennis palpis pedibusque rufis; capite fortiter elongato, prothorace angustiori, pone oculos haud distincte angustato, grosse sat confertim punctato; oculis subo-bsoletis (minus etiam distinctis quam in B. insigni); antennis corporis dimidio plane longioribus; prothorace elytris angustiori, sat fortiter transverso, canaliculato, antice angustato, grosse punctato, lateribus sinuatis, margine laterali elevato, angulis posticis rectis; elytris amplis, profunde sulcatis, sulcis fortiter sat confertim (punctis magnis) punctatis, interstitiis fortiter elevatis, humeris prominulis; corpore subtus grosse punctato, segmentis ventralibus tribus ultimis fere lævibus. *Long.* 13 *mm.*

Konahuanui, Oahu. One example.

B. blaptoides is pretty closely allied to *B. insignis.* It differs in the punctuation of the head, the greater breadth of the thorax, greater convexity of elytra, closer punctuation of the elytral furrows (in which the punctuation is continued to the apex), &c.

BEMBIDIIDÆ.

BEMBIDIUM (LOPHA).

B. PACIFICUM, *sp. nov.*

Subconvexum, æneum, antennarum basi, palpis, pedibusque testaceis (multis exemplis plus minusve infuscatis); capite mediocri; oculis fortiter convexis; antennis corporis dimidio vix longioribus; prothorace transverso, cordato, obsolete canaliculato, *antice leviter emarginato, trans basin obscure rugato punctatoque, angulis posticis subrectis; elytris ovalibus, antice et postice, plus minusve distincte, flavo-maculatis, profunde punctato-striatis, striis apicem versus evanescentibus, humeris rotundatis.* *Long.* 4½—5 *mm.*

Oahu. Rare, but widely distributed, from the sea-level to an elevation of about 3000 feet.

TACHYS.

T. OAHUENSIS, *sp. nov.*

Parum convexus, piceo-niger, antennis palpis pedibusque flavo-testaceis (illis plus minusve infuscatis); capite sat magno; oculis permagnis, convexis, antennis corporis dimidio longioribus; prothorace transverso, postice parum angustato, obsolete canaliculato, angulis posticis subacute productis; elytris subparallelis, obsolete striatis, striis duabus internis distinctioribus, cœteris obsoletis, striâ recurvâ profundâ, antice introrsum flexâ. humeris (fere acute) quadratis. *Long.* 2¼—2¾ *mm.*

Oahu. Not uncommon on salt marshes near the sea.

T. ARCANICOLA, *sp. nov.*

Subconvexus, rufo-brunneus, antennis palpis pedibusque testaceis; capite oculisque mediocribus, his parum convexis; antennis submoniliformibus, corporis dimidio vix longioribus prothorace transverso, postice parum angustato, leviter canaliculato, basi utrinque foveolato, angulis posticis acute rectis; elytris ovalibus, striis duabis internis distinctioribus, cœteris subobsoletis, striâ recurvâ antice reflexâ, humeris rotundato-rectis. *Long.* 2—2¼ *mm.*

Oahu. Very local, but not rare in some mountain localities.

T. MUCESCENS, *sp. nov.*

Subconvexus, testaceus, elytris plus minusve infuscatis; capite magno; oculis permagnis convexis; antennis submoniliformibus, corporis dimidio brevioribus; prothorace fortiter transverso lato (elytris parum angustioribus), postice parum angustato, canaliculato, transversim basi fortiter depresso, angulis posticis rectis; elytris subparallelis, striis tribus internis profunde impressis, cœteris obsoletis, striâ recurvâ brevi fortiter arcuatâ, humeris rotundatis. *Long.* 2¼ *mm.*

On the plains of Honolulu. One specimen in decaying vegetable matter.

T. ATOMUS, *sp. nov.*

Parum convexus, testaceus, nonnullis exemplis plus minusve infuscatis (prœsertim capite); capite magno; oculis parum convexis; antennis moniliformibus, corporis dimidio vix longioribus; prothorace fortiter transverso, postice angustato, angulis posticis rotundato-obtusis; elytris subparallelis, striâ suturali distinctiore, stria recurvâ brevi, parum flexâ, cœteris obsoletis, humeris rotundato-rectis. *Long.* 1¼ *mm.*

Oahu. Not rare, in moss, &c., in mountain localities.

Honolulu: 1878.

LIST OF THE *HEMIPTERA* OF NEW ZEALAND.

BY F. BUCHANAN WHITE, M.D., F.L.S.

(*Continued from page* 133).

Tribe ANTHOCORINA.

Only one species of this section has as yet been found in New Zealand. Others may confidently be expected to occur, but, from their (probable) small size, might easily be overlooked.

43. *Cardiastethus Brounianus*, *n. sp.*

Piceous-brown, clothed with long pale hairs; clypeus, anterior margin of the embolium, and the corium, rather paler; second joint of the antennæ (apex excepted) and legs brownish-yellow; membrane dark fuscous, with the outer three nerves margined with whitish. Head, pronotum and scutellum finely transversely rugose; transverse depression of the pronotum nearly obsolete; central depression of the scutellum rather shallow. ♂. Length, 2—2½ mm.

A few specimens taken by Captain Broun.

Tribe REDUVIINA.

A single species only (which I have not seen) of this group is reported from the Islands, viz.:

44. *Pirates* (*Brachysandalus*) *ephippigera*, White.

Tribe EMESINA.

45. *Emesodema Huttoni*, Scott. This I have not yet seen.

Tribe NABINA.

46. *Nabis Saundersi*, *n. sp.*

Elongate, pale yellowish-testaceous; a central longitudinal band running from the head to the scutellum fuscous-black; the cicatrices of the anterior part of the pronotum fuscous; back of the abdomen (connexivum excepted) fuscous, with a black central longitudinal band somewhat dilated at the base of each segment; a narrow intramarginal band on each side of the body below, the middle of the mesostethium, and a narrow longitudinal band on the centre line of the venter, fuscous; first and second joints of the antennæ, and the legs, concolorous with the body, the apex of the second joint of the former fuscous-black, and the last two joints pale fuscous; spots on the legs and apex of the tarsi fuscous-black; hemielytra longer than the abdomen, pale greyish-testaceous, with the three usual dark spots, the veins margined, and the interstices, especially the first, irrorated with fuscous; membrane pellucid with fuscous veins. Head and neck about as long as two-thirds of the pronotum; the first joint of the antennæ shorter than the head before the eyes; pronotum convex and moderately widened behind, the posterior lobe without oblique streaks, the base sub-equal to the length; the front femora about as long as three-fourths of the head and pronotum taken together.

♂ ♀. Length, 8—9 mm.; breadth, 2 mm.

Messrs. Broun, Hutton, and Wakefield. N. *Saundersi* is rather like *N. ferus*, but is longer, and the apex of the membrane seems to be less rounded, the pronotum is longer, and less and more gradually widened, &c.

47. *N. maoricus*, Wlkr.

Only known to me by the description, from which it appears to be a species distinct from No. 46, though said to be also allied to *N. ferus*. It is described as having an entirely pale scutellum and four black spots on the hemielytra.

Tribe SALDINA.

In addition to *Salda australis*, Buch. White (E. M. M., xiii, 106), three other New Zealand species are before me, but not in sufficient numbers or condition to admit of anything like complete descriptious. They may, however, be thus indicated—

48. *Salda australis*, Buch. White.

Belongs to the same section, in Stål's "Enumeratio," as *S. saltatoria*.

Captain Broun (one specimen).

49. *S. Butleri*, *n. sp.*

Long-oval, black, with short unicolorous hairs and scattered golden hairs; the dilated margin of the pronotum, a small spot beyond the disc of the clavus, three spots on the front margin of the corium, a streak exterior to and near base of the first nerve, two confluent spots interior to the nerve, and five or six spots on the apical half of the corium, brownish-yellow; membrane brownish-fuscous, spotted with paler in the cells, the nerves darker, especially at the base, and the outer side of the first cell strongly margined with black; sides of abdomen below, and last segment, broadly pale. Pronotum broadly semilunar, with dilated and subreflexed side margins; scutellum large; membrane well defined, large, with four cells.

Length, 5 mm.

Professor Hutton (one example). Belongs to the section of *S. coxalis*.

50. *Salda sp.*———.

Too immature to determine, but evidently allied to the last.

Professor Hutton (several specimens).

51. *S. lælaps*, *n. sp.*

Shortly obovate, black, with black and golden hairs; the clypeus, sometimes the hinder part of the hind margins of the pronotum, and a variable number of small spots on the hemielytra, brownish- or whitish-yellow; legs yellowish, a broad band at the middle of the femora, and the apex of the tibiæ and of the tarsi, blackish; sides of pronotum somewhat dilated and narrowly reflexed; membrane small, rather coriaceous, and hence not well defined, with four cells, of which the inmost one is very short.

♂ ♀. Length, 4—4½ mm.; breadth beyond middle, 2½—3 mm.

Mr. Wakefield (two specimens).

Tribe NOTONECTINA.

52. *Anisops Wakefieldi, n. sp.*

Pale yellowish-white, shining; scutellum black, margined with yellowish-white; abdomen blackish, spotted above with yellow; legs margined with fuscous; hemielytra sub-vitreous. Frons slightly furrowed, scarcely produced; anterior part of the pronotum slightly and very obtusely keeled; breadth equal to the length of the pronotum and scutellum taken together; front tibiæ of the male broader *at the apex*; front tarsi monomerous, *twice* the length of the claws.

♂ ♀. Length, 9 mm.; breadth, 2¾ mm.

Messrs. Hutton and Wakefield. Sometimes (but rarely) the scutellum is entirely pale.

53. *A. assimilis, n. sp.*

Very like *A. Wakefieldi*, but smaller; scutellum not or only slightly marked with black; back of the abdomen yellow, marked with black; front tibiæ of the male broader *at the base*, front tarsi *four times* as long as the claws.

♂. Length, 6—7½ mm.; breadth, 1¾—2 mm.
♀. Length, 7½—8 mm.; breadth, 2 mm.

Professor Hutton. Female specimens apparently belonging to this species are scarcely separable from *A. Wakefieldi*, except by their smaller size and paler scutellum. The labrum, however, seems to be longer in *assimilis*, reaching nearly to the middle of the third joint of the rostrum, while in *Wakefieldi* it scarcely extends beyond the base.

Tribe CORIXINA.

54. *Corixa (Corixa) arguta, n. sp.*

Fuscous-black, shining; pronotum obsoletely keeled, sub-rastrate, with about ten yellow lines, which are here and there split and anastomose; hemielytra scarcely rastrate, sparingly clothed with pale adpressed hairs, and marked with irregular, undulated, broken and angular yellow lines, those at the base of the clavus sub-transverse and sub-entire, those of the corium crossed by four indistinct longitudinal streaks of the ground colour; lines at the margins of the hemielytra longitudinally sub-confluent; lines of the membrane transverse and sub-entire at the inner basal angle, the others hieroglyphic-like; membrane-suture narrowly marked with yellow in the middle; the pale embolium suddenly dilated about the middle; back of the abdomen fuscous; vertex, clypeus, sternum and venter pale, the sternum sometimes spotted with black; legs pale, the joints somewhat fuscous-brown, hind tarsi with fuscous hairs.

♂. Palæ cultrate, rounded on the back, a little produced at the base below; frontal fovea oval, passing a little beyond the lower angle of the eyes; venter fuscous in the middle; strigil circular, furnished with eight more or less shortened rows of teeth.

♀. Palæ narrowly cultrate.

Messrs. Hutton and Wakefield (many specimens). Rather variable in *size, but constant* in the markings.

(To be continued).

Apion Schœnherri in abundance in Sheppy.—While Mr. G. C. Champion and I were prospecting for beetles on the Sheppy marshes one bitterly cold morning at the end of October, it occurred to us to pull up a few tufts of withered grass at the roots of some willows growing on the bank of a fresh water ditch. These tufts we found to swarm with yellow-legged *Apions*, among which *A. Schœnherri* (hitherto taken very rarely by me in stack refuse some years ago) was by no means uncommon.

Yesterday, we again visited the same spot; it was too cold and damp for outdoor work, but we gathered a quantity of "shakings," and, on examining these at home, we obtained *A. Schœnherri* in large numbers. *A. difforme* was by far the commonest species, occurring literally in thousands; *lævicolle* was by no means rare, and there were a few *pubescens*; such plebeians as *A. fagi, assimile, trifolii, nigritarse, vorax, æthiops, virens,* being well represented in point of numbers. The only other beetles at all worth mentioning were about a dozen of *Throscus obtusus*, and plenty of *Sunius intermedius*.

In other parts of the Isle of Sheppy, we found a few beetles, of which *Engis humeralis* and *Coryphium angusticolle*, under decayed elm bark, and *Limnichus pygmæus* and *Telmatophilus brevicollis*, in pond refuse, perhaps deserve a passing notice.

I was not a little surprised, on casually examining a dead ash tree, to find under its decaying bark, riddled with ancient burrows of *Hylesinus crenatus*, a goodly number of *Diphyllus lunatus*—a beetle I certainly did not expect to see in Sheppy.—James J. Walker, R.N., 7, West Street, Blue Town, Sheerness: *Nov. 12th*, 1878.

[Mr. Walker's interesting experience of this rare *Apion* is curiously corroborative of my own some years ago at Seaford, with the exception that I found the beetle in smaller numbers. *Apion lævicolle* in thousands was with it, and *difforme* in great abundance, besides commoners. All were in and about old furze bushes.—E. C. R.]

Description of the larva, &c., of Myelois pinguis.—In Stainton's Manual, the undescribed larva of this species is said to feed in decayed ash trunks; and Hofmann, in his work of 1875, gives no description of it, but merely says, "In spring, under the bark of ash": neither is any description of it afforded in the interesting records of capture of the perfect insects, to be met with in the Entomologist's Weekly Intelligencer (*vide* vol. vi, p. 164, and vol. viii, pp. 131—133—179), although the finding the larva is mentioned, together with good hints for collectors; I therefore hope now to throw some light on the larva, and a little on its habits, so far as they have been ascertained with much perseverance by Dr. Wood (of Tarrington), who kindly provided me with examples of the larva and pupa *in situ* to figure.

This larva inhabits the *living* bark of ash, frequently pollard trees, never affecting any dead or decayed portions of a tree nor penetrating to the wood, nor does it eat far into the bark, however thick, but generally less than an inch, and mines more of a chamber than a gallery; as it grows it enlarges its original small round hole of entrance, which eventually becomes of a size sufficient for the escape of the moth; but there are always a few long black grains of frass blocking the entrance; this frass is characteristic, and should be looked for, when searching a tree, on any projecting bosses as well as on the spreading foot, upon which it sometimes falls and lodges; for stray grains of frass detected below afford a good clue to the situation of the mine above.

Of three larvæ I received on the 13th of July, 1877, two were quite small and feeding slowly, while one was full-fed, and this, when safely extracted from the piece of bark for the purpose of depicting, was soon afterwards induced to enter a goose-quill, where it chose to remain and spin its cocoon, enabling me to watch its progress through the transparent medium during a day and a half, when it became quite opaque.

On the 22nd July, other pieces of ash bark, containing a pupa and a larva not quite half-grown, arrived from the same kind friend, and this larva lived on as long as I could keep the bark fresh and edible, but it died during the autumn, having made scarcely any additional growth while in my keeping, although after the first inspection I did not again disturb it, for at that time, after clearing away the frass to ascertain the exact direction of the mine, I noticed that in a few minutes afterwards the entrance was again blocked up with more frass by the larva within.

In 1876, Dr. Wood found a full-fed larva at the end of May and bred the moth on the 8th July following; and in 1877, on the 19th July, he found a pupa and three young larvæ not half-grown. Of the two moths I bred myself, the first was a female from the pupa within the before-mentioned quill on the 2nd of August, and, on the 15th, a male from the pupa within the bark.

It appears that some of the larvæ are feeding the whole summer through, but whether they are more than one year in feeding up is at present a doubtful point, the evidence being rather conflicting, although it justifies Dr. Wood's opinion that some portion of a brood passes two seasons in the larval state.

The larva when young is very pale, of a dirty whitish or greyish colour, having a blackish-brown head and plate at each end of the body, and showing partially an internal dorsal vessel of dark greyish ; but when full-grown it measures about three-quarters of an inch in length and is tolerably stout in proportion, tapering a little from the third segment to the head which is flattened and less than the second in width, it tapers also a little from the eleventh to the anal tip ; beyond the thoracic the other segments on the back have each one sub-dividing deepish wrinkle, followed by one or two more or less distinct though they are deeper on the sides, and the region beneath the spiracles is puckered, the anal legs are close together and well beneath the end of the body: the colour of the head is chestnut-brown marked with blackish-brown, the plate on the second segment is much paler in front but broadly blotched at its hind margin with the darker brown where it is dorsally divided, the anal plate is chestnut-brown ; the ground colour of the back and sides is a deepish flesh tint, gradually becoming paler and rather ochreous on the belly ; an interrupted dorsal line of much darker flesh colour shows plainly on the front of each segment just as far only as the transverse wrinkle, the tubercular dots and the brown hair emitted by each are so minute as to be visible only through a lens, the characteristic ocellated spot on each side of the third and twelfth segments is ringed with chestnut-brown, having a flesh-coloured centre with a longish hair, the small round spiracles are of the ground colour ringed with brown, the anterior legs chestnut-brown, these, and the head, the plates, and ocellated spots, are highly lustrous, while all the rest of the body appears soft and smooth, but without gloss.

The pupa, while occupying the mine in the bark, is closely enveloped with a coating of whitish silk as a cocoon so thin and clear that its form, and even a little of its colour, can be rather plainly seen through the silk, the head lying very near the entrance of the mine, which is lightly blocked with frass, of which a great quantity lies around and behind the cocoon; the pupa itself, according to sex, measures nearly or quite half an inch in length, and one-eighth in diameter at the end of the wing-covers; the general appearance is rather slender and of usual form, but with the abdomen tapering off gradually to a rounded tip without any projections; its colour is light brownish-ochreous or light reddish-brown on the wing-covers, rather darker on the thorax and abdomen, and the surface glossy.—WILLIAM BUCKLER, Emsworth: *23rd August*, 1878.

Heliothis peltigera near Tenbury.—I should like to report my capture of a fair specimen of this species, which I saw flying in the sun in a lane in this town, and secured with a pill box on June 24th. It may also be of interest to state that in June, 1873, I saw a magnificent specimen of *Drepana sicula* at rest in Leigh Wood, Bristol, which I also took with a pill box. It was seen, while still alive, by the Rev. J. Greene. I have not been able to look for this species since.—W. CLAXTON, Tenbury, Worcestershire: *November*, 1878.

On the preservation of Aphides, and other soft-bodied insects, for collections.—The difficulty of preserving soft-bodied insects in a scientifically serviceable condition is well known, and although it has been evaded, rather than overcome, by putting some into tubes filled with alcohol or other antiseptic fluid, yet the delicate and fragile character of others has rendered this mode impracticable; while their softness causes them, if dried in the ordinary way, to shrink so that no parts can be recognized. Thus with *Aphides*, for example, the bodies become so shrivelled and shapeless that the collector had at best, as Dr. Horváth says (Ent. Nachr., iv, p. 103), to congratulate himself if he possessed the wings.

Herr D. H. R. von Schlechtendal has, however, recently communicated to the "Entomologische Nachrichten," iv, p. 155, a mode of preserving soft insects by means of the sudden application of great heat, the statements of which I here condense for the benefit of those who are desirous to have a collection, say of *Aphides* in all stages of their existence, preserved in form and colour; these advantages being claimed for the method, and vouched for by Herr Kaltenbach, and Drs. Giebel, Taschenberg, Mayr, and Rudow. Such a collection is now rendered more requisite by the researches of M. Lichtenstein, and, in addition for us in Britain, by the work on our indigenous species by Mr. Buckton, now in course of publication.

The heat is derived from the flame of a spirit or petroleum lamp; above this is placed a piece of sheet-tin, and over this the roasting proceeds. A bulging lamp-cylinder, laid horizontally, serves as a roasting oven; in this the insect to be dried, when prepared as directed, and stuck on a piece of pith, is to be held over the flame; or the cylinder may be closed at the lower end with a cork, which should extend far inwards, and on this the insect should be fastened; the latter mode being preferable because the heat is more concentrated and one hand is left free. The mode of procedure varies according to the nature of the objects to be treated.

For the class of larger objects, such as *Hemiptera*, *Cicadina* and *Orthoptera*, in their young stages of existence, the heat must not be slight, but a little practice shows the proper temperature required. If the heat be insufficient, a drying up instead of a natural distention ensues. The insect to be roasted is to be pierced by a piece of silver wire on the under side of the thorax, but it is not to be inserted so far as to damage the upper side, and the wire should then be carried through a disc of pith, placed beneath the insect, on which the legs should be set out in the desired position. But with some objects, such for instance as a young *Strachia*, the drying proceeds very quickly, so that if distention be not observed then the heat is too great, for the expansion of the air inside will force off the head with a loud report; also with softer, thicker *Pentatomidæ* care must be taken to begin with a heat only so strong that the internal juices do not boil, for in such case the preparation would be spoilt. It is of advantage to remove the cylinder from time to time and test, by means of a lens, if a contraction of the skin has taken place on any part, if so the roasting is to be continued. The desired hardness may be tested with a bristle or wire.

For *Aphides*. The *living Aphis* is to be put on a piece of white paper, and at the moment when it is in the desired position it is to be held over the flame, and in an instant it will be dead and will retain the attitude. Then put it, still on the paper, into the oven; or, still better, hold it over the heated tin, carefully watching the drying and moving the paper about in order to prevent it getting singed. The roasting is quickly accomplished in either way, but somewhat slower out of the oven, especially in the larger kinds, such as *Lachnus*. If the paper turn brown it is a sure sign that caution is requisite. To pierce these brittle preparations for preservation is hazardous, and it is a better way to mount them with gum on card, placing some examples on their back.

For *Cecidomyiæ*, *Agromyzæ*, *Cynipidæ*, and other small insects liable to shrink, yet containing but little moisture, uch as *Poduræ*, *Pediculi*, *Psyllidæ*, &c., another method is adopted. Over the insect, mounted on a wire, &c., as above directed, a thin chemical re-agent glass, or glass rod, heated strongly at one end, is held, and the heat evolved is generally sufficient to bring about the immediate drying and distension, but if the heat be too little the process must be repeated; and although by this method the danger of burning is not obviated, yet the position of the legs is maintained much better than by the aforesaid roasting.

Larvæ of all kinds, up to the size of that of *Astynomus ædilis*, even when they have long been kept in spirits, may be treated successfully by the roasting method; but with these objects care must be taken that the heat is not too strong or else the form will be distorted. For small larvæ it is preferable to use a short glass, in order better to effect their removal without touching the upper part, which becomes covered with steam, and contact with which would cause the destruction of the preparation. Larvæ of *Coleoptera*, which contain much moisture or have a mucous surface, must lie on a bed of paper or pith in order to prevent adhesion and burning, and these may be further avoided if the cylinder be slightly shaken during the process, and the position of the object be thereby changed.

I have not had an opportunity of trying the roasting process, but it does not seem to be difficult in any of its modifications, and with practice and care would become easy. It is admitted that with slender-limbed insects the joints are rendered very brittle, but practically this condition can hardly be worse than that which results from ordinary drying. I would suggest the trial of pieces of talc—an incombustible transparent material—cut into appropriate sizes, and that on these the insects should be fixed in proper position by means of gum tragacanth (thus dispensing with the wire). I think that the drying would be facilitated, and the talc might remain as a permanent support and be fixed in the cabinet in the manner suggested by Mr. Edwards, *vol. xiii, p. 282*.—J. W. Douglas, 8, Beaufort Gardens, Lewisham: *November 13th, 1878*.

Migrations of Plant-lice.—My suppositions about the change of habitat of the *Aphides*, belonging to the group of the *Pemphigians* (mostly gall-makers on trees), have become a reality.

I can affirm to-day that the gall-louse of the *Lentiscus*, *Aploneura lentisci*, Passerini, passes, when it becomes winged, to gramineous plants (*Bromus sterilis*, *Hordeum vulgare*), and there deposits apterous young ones, which feed on the grass roots during the winter, and in spring become winged and return to the *Lentiscus*, where they deposit the sexuated *pupæ*. From these pupæ emerge both males and females "*without rostrum;*" they copulate, and the female lays "*a single egg,*" from which proceeds the gall-maker. This is a new confirmation of my theory about the cycle of life of a *Pemphigian*, viz.:—

(1.) The egg: generally only one in each female; out of it comes:

The *Fundator* (first larval state) forming the gall, becoming, after four moults, a *vivigemmous Pseudogyne*, and filling up the gall with its *proles*. That *proles* becomes, after four moults,

(2.) the *Emigrant* (second larval state), winged *Pseudogynes*, also *vivigemmous*, leaving the galls and flying on to gramineous plants, on which they deposit small lice, which are

(3.) the *Gemmantia* (third larval state). This is the curious stage of unlimited apterous reproduction under ground, very much in the same way as the *Phylloxera vastatrix;* out of these numerous colonies in spring, emerge some nymphs, giving a winged form, which is

(4.) the *Pupifera* (fourth larval state), winged *Pseudogyne*, which carries back to the *Lentiscus* the pupæ, from which the little apterous *male and female* lice, *destitute of rostrum*, issue, and, after copulation, the female lays the fecundated egg, which closes the circle.

J. Lichtenstein, La Lironde, près Montpellier: 16*th November*, 1878.

The Doubleday Collection.—Since the publication of Mr. A. B. Farn's letter in the "Entomologist," for October, on the above subject, I have inspected the "Doubleday Collection," at Bethnal Green.

I attended at the Museum fully expecting to see the collection in a most appalling and disgusting condition, but my fears were totally unfounded. Drawer after drawer was duly inspected, and returned to its place, but, strange to say, no signs of mites, grease, or any other kind of neglect appeared. The whole collection was in the most exquisite and unparalleled condition, and, to say the least of it, is the best I have ever had the pleasure to inspect. I cannot conceive why Mr. Farn should accept questionable information and publish it in such a manner, and as an unbiassed individual I am decidedly of opinion that some satisfactory explanation is due;—surely some mistake has been made. With regard to the question of adding fresh insects to the collection—perhaps Mr. Farn will kindly mention some other method of replacing old and faded specimens (of which, however, I failed to find any); I candidly admit that I am totally unable to do so.

I am informed that three parcels only have been received in answer to the notice—a fact, I believe, almost entirely due to Mr. Farn's letter; although I am equally sorry to see outside specimens added to the collection, in the absence of any other suggestion I would submit that a small round-punched label, coloured red, should be affixed, by transfixing with the pin, under the bodies of the fresh specimens in such a manner that a portion of this mark of their origin may be seen; this will not in any way affect the appearance of the fresh insects, but it will effectually separate them from the others.—**Wm. J. Vandenbergh**, Junr., Hornsey, Middlesex: *November* 13*th*, 1878.

[The proper place for the foregoing communication is in the journal where the statement originally appeared. Our correspondent doubts (we hope needlessly) its acceptance for publication there. The action of the Doubleday trustees rendered the collection public property, and we shall be glad to hear from other sources that its condition is such as here stated; we shall consider it our duty to make a personal inspection. Although the collection cannot be considered a "type-collection," it is greatly to be regretted that it should be tampered with, either by additions or substitutions. If this be done we doubt not that proper means will be taken to indicate these.—Eds.].

Obituary.

Victor Ghiliani. We regret to learn that this well known Italian entomologist died on the 27th of May last: he had long, we think, been in delicate health. For many years he had been attached to the Royal Zoological Museum at Turin; was one of the founders of the Italian Entomological Society; and one of the oldest and best known of the now numerous school of Italian entomologists. His writings (which are numerous) almost entirely concern the insects of his native land, in which he did good work. All who have had the pleasure of meeting him at Turin, or who have had occasion to correspond with him, will bear testimony to his courtesy and extensive entomological knowledge.

Thomas W. Wonfor. This gentleman died at his residence, 38, Buckingham Place, Brighton, on Sunday, the 20th October last, after a few weeks' illness, in the 51st year of his age.

Shortly after the formation of the Brighton and Sussex Natural History Society in 1853, Mr. Wonfor was appointed an honorary secretary, a post he continued to fill up to the date of his death, and in the performance of the duties of which he displayed an extraordinary amount of ability, energy, and tact. The prosperity and advancement of this Society, and by means of it the diffusion of scientific knowledge in Brighton and Sussex, was the object for which he laboured for nearly a quarter of a century with the devotion of an enthusiastic naturalist.

The papers on entomology, and nearly every other branch of zoology, communicated by Mr. Wonfor to the Proceedings of the Brighton and Sussex Natural History Society are very numerous, and the excellence of many of them has obtained for their author a more than local reputation. It was, however, as a microscopist that Mr. Wonfor chiefly distinguished himself, and one of his papers "On certain Butterfly Scales, characteristic of Sex," read at Brighton in November, 1867, was subsequently published in the 8th volume of the Microscopical Journal. In addition to his very numerous papers in the Proceedings of the Brighton and Sussex and other Natural History Societies, Mr. Wonfor frequently contributed to "Scientific Opinion," "Scientific Gossip," and other periodicals. On the occasion of the visit of the British Association to Brighton in 1872, Mr. Wonfor took a very active part in their proceedings, and acted as Secretary to one of the Committees.

Without claiming for the deceased the position of a distinguished scientific specialist, it may be safely affirmed that few men ever possessed a larger amount of *general information on almost* all branches of Science, or have been more willing *to impart it for the benefit of* others, than the amiable and accomplished gentleman whose death must be a source of sorrow to his numerous friends, and an irreparable loss, not only to Members of the Natural History Society of Brighton, but to his fellow townsmen generally.

Mr. Wonfor was appointed Curator of the Brighton Free Library and Museum in 1875; he was elected a Fellow of the Linnean Society in June, 1877, and a Member of the Entomological Society in February last.—H. Goss.

ENTOMOLOGICAL SOCIETY OF LONDON: *6th Nov.*, 1878.—H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

Mr. F. Smith explained, that when (at the Meeting on September 4th) he stated that the Linnean collection had been allowed to fall into a state of complete neglect, he did not wish to infer that it was infested by *Acari*, *Psoci*, or *Anthreni*. He only examined two drawers of the collection.

Mr. C. O. Waterhouse exhibited *Chauliognathus excellens*, a new species, from Columbia.

Mr. Stainton exhibited *Tinea orientalis*, bred from buffalo horn (*vide ante*, p. 133).

The Rev. H. S. Gorham exhibited *Platypus cylindrus*, *Lathrobium pallidum*, *Achenium humile*, and *Cryphalus abietis*, from the neighbourhood of Horsham.

Mr. Goss exhibited *Cordulia* (*Oxygastra*) *Curtisi* from Hampshire (*vide ante*, p. 92).

Mr. Meldola exhibited a male of *Erebus odorus*, L., from Jamaica, a species remarkable for the large scent-tufts on the posterior legs.

Prof. Wood-Mason exhibited examples of *Gongylus gongyloides*, L., and *G. trachelophyllus*, Burm., which he was convinced were specifically distinct, notwithstanding Saussure's opinion that the latter was only a variety of the former. He remarked on the geographical distribution of both forms, and on the differing mimetic analogies they presented.

In connection with this latter subject, Mr. Distant reminded the Meeting of Waterton's statement that the "rattle" of the rattle snake suggested such a similitude to an Orthopterous insect, that might be of service to the former by deceiving or attracting birds.

Mrs. Randolph Clay (present as a visitor) exhibited the species of *Zopherus* (still living) worn as an ornament by the ladies of Central America, as recorded at p. 116, *ante*.

Sir S. S. Saunders sent for exhibition examples of *Blastophaga Phenes*, L., sent to him by M. Lichtenstein, and employed for purposes of what is termed "caprification." Also *Sycophaga crassipes*, Westwood, used for the same purpose, on the sycamore fig of Egypt; notes on these insects (and on some others connected therewith) were read.

The Secretary read a report from H. M. Consul at Taganrog (forwarded by the Board of Trade) relative to the enormous destruction of grain in Southern Russia by *Anisoplia austriaca* (one of the *Rutelidæ*). A Committee was appointed to report thereon.

Miss E. A. Ormerod read a paper on the destruction to carrots caused by the too-well-known *Psila rosæ* (with figures). She had tried the effect of phenol in arresting the ravages, and an analysis of the roots appeared to show that its use was beneficial, without detracting from the edible qualities.

Mr. C. O. Waterhouse read descriptions of new *Telephoridæ* from Central and South America.

Mr. Distant read descriptions of new species of Hemiptera-Homoptera.

INTRODUCTORY PAPERS ON FOSSIL ENTOMOLOGY.

BY HERBERT GOSS, F.L.S., F.G.S.

No. 4.

Palæozoic Time.

[*On the Insecta of the Carboniferous Period, and the animals and plants with which they were correlated.*]

In the Carboniferous rocks, remains of insects have been found occasionally, but they are far from common, and up to the present time only about ninety-four[*] species have been described. Of these, five or six were obtained from the United Kingdom,[†] about sixty-six from the continent of Europe,[‡] and some twenty-two from North America.[§]

In my last paper,[||] I briefly described the few fossil insects which have been discovered in the Devonian rocks of North America. These fossils, it will be remembered, all belonged to the Order *Neuroptera*, or, rather, *Pseudo-Neuroptera.*

In the Carboniferous rocks, remains of the *Neuroptera* are much more numerous, and in addition to some twelve species which, from their possessing characters common both to that Order and the *Orthoptera*, have been placed by Dr. Goldenberg in an extinct Order,[¶] about twenty-five species have been determined.

The *Orthoptera* of this period are represented by more than fifty species, and this Order and the *Neuroptera*—if we include in the last named, the species referred by Goldenberg to his *Palæodictyoptera* —comprise all the insects yet discovered from rocks of this age, except five, two of which have been referred to the *Coleoptera*,[**] and three to the *Hemiptera*.[††]

Had the two last-named Orders been thoroughly established, and widely distributed, geographically, at this period, their remains would, in all probability, have been discovered at least as frequently as those of the *Neuroptera* and *Orthoptera.*

It appears, therefore, that at this period the *Neuroptera* (including therein the *Palæodictyoptera*) and the *Orthoptera* were the dominant Orders, and that, towards its close, the *Coleoptera* and *Hemiptera* began to make their appearance.[*]

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[*] At page 53, *ante*, I spoke of the insects obtained from the carboniferous rocks as including nearly ninety species. Since the date at which I wrote, several others have been described in the Proc. Bost. Soc. Nat. Hist., vol. xix, 1877–78, and elsewhere.

[†] Coalbrook Dale, Shropshire; near Sunderland; near Glasgow, &c.

[‡] Wettin and Loebejün, in Westphalia; Gersweiller and Saarbrück, near Trêves; Mannebach, in Thuringia; Erbignon, Valais, Switzerland; Sars-Longchamps, Mons, and elsewhere in the Belgian coal fields, &c.

[§] Frog Bayou, Arkansas; Cape Breton; Talmadge, Ohio; Morris, Illinois; Pittston, Pennsylvania, &c.

[||] *Ante*, pp. 124—127.

[¶] *i. e., Palæodictyoptera.* See "Fauna Saræpontana Fossilis," 1877, p. 50.

[**] *Curculioides Ansticii* and *Troxites Germari.*

[††] *Fulgorina Ebersi, F. Kliveri*, and *F. lebachensis.*

Great Britain.

Of the five fossil insects obtained from the British coal measures, four have been referred to the *Orthoptera*, and one to the *Coleoptera*. The representative of the last named Order is the oldest *British* fossil insect known. It was discovered in the Ironstone of Coalbrook Dale, Shropshire, and was described by Dr. Buckland[†] as *Curculioides Ansticii.*[‡]

The first-discovered species of *Orthoptera* from the British Carboniferous rocks was also obtained from the Ironstone of Coalbrook Dale, and was described by Dr. Mantell[§] as belonging to the genus *Corydalis* of the *Neuroptera,* and named by him *Corydalis Brongniarti.* It has since been decided that it belonged to the *Orthoptera,*[||] and it has been referred to the genus *Gryllacris.*

In addition to these fossils, three fragments of *Orthoptera* were discovered, some years ago, in the Durham coal fields.[¶] One of the fragments is described by Mr. Kirkby as being a very fine, distinct example of the anterior portion of the fore-wing of an insect, in form and neuration agreeing with the recent genus *Blatta,* but approaching the *Mantidæ.*[**] The third specimen[††] is believed from its shape and neuration, to be the abortive anterior wing of some species belonging to the *Phasmidæ,* but it is impossible to pronounce with any certainty as to its probable affinities. The most recently-discovered fossil insect from British strata of this period, was obtained from the Scottish coal fields, and has been referred[‡‡] by Dr. Henry Woodward to the *Mantidæ,* and named by him *Lithomantis carbonarius.*

This specimen concludes the scanty list of fossil-insects discovered in the British Carboniferous rocks: and I will now call attention to some of the most interesting of those which have been obtained from the coal fields of continental Europe.

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[*] See *antea,* p. 56.

[†] Bridgwater Treatise, vol. ii, p. 89. See also the Geol. Trans. (2nd series), vol. v, pt. 3, p. 446, and "The Silurian System," pp. 104, 105.

[‡] Dr. Buckland described two insects from Coalbrook Dale as *Curculionidæ, i. e., C. Ansticii* (above mentioned), and *C. Prestvicii;* but Dr. H. Woodward, F.R.S., has decided that the last named fossil should have been referred to the *Arachnida,* and not to the *Insecta.* See Geol. Mag., September, 1871, vol. viii, p. 385.

[§] "Medals of Creation," vol. ii, p. 554.

[||] See a paper by Mr. A. H. Swinton, in Geol. Mag., xi, 1874, p. 337, pl. xiv.

[¶] The locality was the North Bank of the Wear, opposite to Claxheugh, about two miles West of Sunderland. See Mr. Kirkby's paper in the Geol. Mag., 1867, vol. iv, p. 388.

[**] Dr. Goldenberg has included this insect in his list of fossil *Blattidæ,* under the name of *Blattidium mantidioides.* (See Fauna Sar. Fossilis, 1877, p. 20.)

[††] The second specimen appears to be a part of the same insect as No. 1.

[‡‡] Quar. Journal Geol. Soc., Feb., 1876, p 60. In deciding as to the family to which this *fossil belonged, Dr. Woodward* states that he had the advantage of the opinions of Mr. McLachlan, *Prof. Westwood, and Mr. C. O.* Waterhouse.

Continental Europe.

Of the Neuropterous insects,[*] ten have recently been placed by Dr. Goldenberg in the extinct Order *Palæodictyoptera,* before mentioned. The *Neuroptera* from these coal measures include several species belonging to the *Termitidæ,* and one to the *Ephemeridæ.* The last named specimen was discovered by M. Persinaire,[†] in the neighbourhood of Mons, in the Belgian coal fields. It was originally described by M. Preudhomme de Borre, as belonging to the *Orthoptera,* and was named by him *Pachytylopsis Borinensis*; but, after Dr. Breyer had examined it and expressed an opinion that it belonged to the *Lepidoptera,* its name was changed to *Breyeria Borinensis.* This fossil was subsequently submitted to Mr. McLachlan,[‡] when in Brussels, in July, 1877, and he decided, after a careful examination of the wing, in which he detected abundant traces of transversal reticulation, that it could not possibly have belonged to the *Lepidoptera,* and that it was the wing of a Neuropterous insect of the family *Ephemeridæ.*

The fossil *Orthoptera* from these coal measures belong, with few exceptions, to the *Blattidæ,* of which family upwards of thirty[§] species have been identified, including *Blattina helvetica,*[‖] from Erbignon, Valais, which, according to Professor Heer, is the most ancient Swiss fossil animal known.

With one exception—*Polyzosterites granosus*—all the *Blattidæ* from these coal measures are referred to the extinct genus *Blattina.*

The other *Orthoptera* from the European coal measures, include a few species of *Gryllidæ* and *Acridiidæ,* and a supposed species of *Phasmidæ* ?—*Protophasma Dumasi.*[¶]

The first insect belonging to the *Hemiptera* which was discovered in the coal measures, was obtained from the neighbourhood of Cassel, and has been described by Dr. Dohrn[**] as *Fulgora* (*Fulgorina*) *Ebersi.* Two other species, belonging to this order, were subsequently discovered in the coal measures of Saarbrück, viz., *Fulgorina Kliveri*[††] and *F. lebachensis.* The only specimen of *Coleoptera* from European strata of this age was discovered in the coal measures of Saarbrück; it has been described by Dr. Goldenberg under the name of *Troxites Germari.*

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[*] *Dictyoneura libelluloides, D. anthracophila, D. formosa, D. Decheni, D. elegans, D. elongata, D. Schmitzi, D. obsoleta, D Humboldtiana,* and *Omalia macroptera.* For descriptions of these, see Fauna Sar. Fossilis, 1877, *antea cit.,* and Bull. Acad. Belg., 2nd series, vol. xxviii, pp 384—400.

[†] "Notes sur des empreintes d'insectes fossiles," &c., by A. Preudhomme de Borre, in the Ann. Soc., Ent. Belge, vol. xviii, 1875.

[‡] See Compte-Rendu of the Meeting of the Soc. Ent. Belge, in August, 1877.

[§] Die Versteinerungen des Steinkohlengebirges, &c , Halle, 1844 Palæontographica, vol. iv, 1854 Viertelj. der naturf. Gesellsch. in Zurich, vol. ix, 1864. Neue Jahrb., 1869 and 1870. Fauna Sar. fossilis, 1873 and 1877, *antea cit.,* &c.

[‖] Vierteljahrsschr. naturf. Gesellsch., *antea cit.,* p. 273, &c.

[¶] Compte-Rendu Soc. Ent. Belge, January, 1878, pp. 9—12; and Ann. des Sciences Nat., 6 *series. Tome 7, Art No. 4.*

[**] *Palæontographica,* vol. xvi, 1869.

[††] *Neue Jahrb. für Min., &c.,* 1869; and Fauna Sar. Foss., 2nd part, 1877, antea cit.

America.

The fossil insects obtained from the American Carboniferous rocks all belong to the *Orthoptera*[*] and *Neuroptera.*[†] The first named Order includes *Mylacris anthracophilum*, six species of cockroaches, *i.e.*, five *Blattidæ* (*Blattina venusta*, *B. Heeri*, *B. bretonensis*, *B. sepulta*, and *B. fascigera*), and one species referred to a new genus—*Archimylacris*; a cricket—*Archegogryllus priscus*; and a supposed species of *Mantis.*

The *Neuroptera*[‡] comprise thirteen species belonging to the genera—*Miamia*,[§] *Hemeristia*, *Termes*, *Crestotes*, *Megathentomum*, *Euephemerites*,[||] *Libellula* ?, *Haplophlebium*, and *Paolia.* From the neuration of the wings of the species belonging respectively to the genera *Miamia*[¶] and *Hemeristia*, Mr. Scudder is of opinion that they each represented a new family of *Neuroptera*, containing peculiarities both of *Neuroptera* proper and *Pseudo-Neuroptera.* The species belonging to the genus *Termes* (*T. contusus*[**]) is especially interesting as being, I believe, the only fossil specimen of a white ant discovered in America. Amongst the remains, referred by Scudder to his genus *Euephemerites*, is "the well-defined[††] wing of an insect of marked "simplicity." It has been named *E. primordialis* by Scudder, who states that, in this ancient wing, scarcely the slightest differentiation has begun. In this respect, therefore, this wing differs from all others yet discovered; for even in those obtained from the Devonian rocks, the differentiation of the wings is scarcely less perfect than in living insects.

The fossil referred to the genus *Libellula*, is supposed to be the abdomen of a larval dragon-fly; but it appears to be so imperfect and fragmentary, that it is impossible to say to what insect it belonged. It is extremely improbable that this fossil should have belonged to the *Odonata*, which, although abundantly represented in the Jurassic rocks of Solenhofen, and also—though less commonly—in the English Lias, are unknown in rocks of greater antiquity.

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[*] Owen's 2nd rep. Geol., Arkansas, p. 314; Geol. Mag., vol. v, 1868; Canadian Nat., vol. vii (n. s.); Proc. Amer. Assoc., &c., vol. xxiv; Acadian Geol., *antea cit.*, p. 388; Proc. Bost. Soc. Nat. Hist., vols. xi and xix; and Geol. Ill., vol. iii, p. 567.

[†] One of these—*Haplophlebium Barnesi*—is placed by Goldenberg in the extinct order *Palæodictyoptera*

[‡] See Geol. Mag., vol. iii (new series), November, 1876, p. 519.

[§] Silliman's Jour. (2), vol. xxxvii, p. 34; Geol. Illinois, vol iii; Proc. Amer. Assoc., &c.

[||] *Euephemerites simplex*, *E. gigas*, *E. affinis*, and *E. primordialis.*

[¶] Two species, viz., *Miamia Bronsoni* and *M. Danæ.*

[**] *Proc. Bost. Soc. Nat Hist.*, vol. xix, 1878, p. 54.

[††] *Proc. last quoted, p. 37.*

The fossil named *Haplophebium Barnesi* appears to have belonged to the *Ephemeridæ*, and consists of a long* narrow wing, about three and a half inches in length, so that the insect, when expanded, must have measured over seven inches, and so have been much larger than any living species of that family. Mr. Scudder says of it, "The extreme simplicity of the neuration probably places this insect among "*Ephemerina*, although the form of the wing, and the reticulation, "recall the *Odonata*. Other features of the wing resemble the *Odonata*, "and it is not impossible that *Haplophlebium* forms a synthetic type, "combining essential characters of *Odonata*† and *Ephemerina*."

Having now called attention to the *Insecta* of this period, I will briefly refer to the other animals, and to the plants, which existed contemporaneously.

The *Protozoa* of the period are represented, as in the Devonian age, by *Foraminifera*, remains of which, in some of the limestones, occur in great abundance.

The corals and sponges are the principal representatives of the *Cœlenterata*, and the *Echinodermata* consist almost exclusively of *Crinoidea*.

Of the *Arthropoda*, the *Crustacea* include the *Trilobita* and *Eurypterida*, which here make their last appearance, and also *Ostracoda* and *Phyllopoda*. In addition to the *Crustacea* and the *Insecta*, the *Arthropoda* of this period are represented by *Arachnida* (both scorpions and true spiders) and *Myriopoda*, no traces of which have been met with in older rocks.

The *Mollusca* are most abundant in the coal measures, and include *Polyzoa*, *Brachiopoda*, *Gasteropoda*, Tetrabranchiate *Cephalopoda*, *Heteropoda*, &c. Of the *Vertebrata*, in addition to Fishes, which are still principally Ganoids, we find the first traces of *Amphibia*‡ and *Reptilia*.§

The vegetation of this period was most luxuriant, and in its general character was similar to the Devonian, although but few *species* are common to the floras of both periods. Amongst the Acrogens, the ferns, the *Lepidodendra*, and the *Calamites*, were the predominant groups; and amongst the lower Orders of Cryptogams, some traces of fungi or mushrooms have been discovered.

Of the Gymnosperms, the *Coniferæ*|| were well represented, and in rocks of this age we have the first recorded occurrence of Cycads.

The Avenue, Surbiton Hill:
30*th November*, 1878.

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* See plate xvii, fig 1, p. 391, Geol. Mag., Sept., 1867 See also "A Manual of Palæontology," by Prof. Alleyne Nicholson, M.D., p. 186, fig. 129: and Dawson's "Acadian Geology," p. 387.

† Dr. Dawson is of the same opinion; see Geol. Mag., vol. iv, 1867, p. 386. Dr. Goldenberg has placed this insect in the extinct order, *Palæodictyoptera*; Fauna Sàr. Fossilis, ii, p. 50, 1877.

‡ The *Amphibia* of this period belonged exclusively to the extinct Order, *Labyrinthodonta*.

§ *True reptiles were represented by Enaliosaurs* or Sea-saurians. See Dana's "Manual," *antea cit., p. 341.*

|| *Some of their trunks exceeded* 44 feet in height: Lyell's "Elements," 6th edit., p. 473.

ON *ELACHISTA KILMUNELLA* AND SOME CLOSELY ALLIED SPECIES.

BY H. T. STAINTON, F.R.S.

I first indicated an *Elachista* under the name of *Kilmunella* in 1849 in my "Catalogue of British Tineidæ and Pterophoridæ." I purposely use the word *indicated*, for the few lines there printed cannot be called a description. I quote them *verbatim*:

"Exp. 4½ lines. Anterior wings grey, the first fascia angulated towards the "hinder margin: head grey.

"This is the *subbistrigella* of many cabinets.

"I took this in a boggy place on the top of the hill at Kilmun in June."

In 1854 appeared my volume of the "Insecta Britannica: Lepidoptera Tineina," and this contains (p. 253) the first actual description of the insect indicated above.

For convenience of reference, I again quote the diagnosis and description:

"*Kilmunella*, Sta. Cat., p. 25 (1849). Alis anticis saturate obscure griseis, "*fascia recta alba* ante medium, *maculis* ante apicem *duabus in fasciam sæpe con-* "*nexis* albis (♀ basi tota alba, sub costa tantum cinerea); capite, cum palpis, "*saturate griseo*. Exp. al. 4½—5 lin.

"Head, face, and palpi dark grey. Antennæ dark grey. Anterior wings dingy "dark grey, with a *nearly straight white fascia* in the middle, and two nearly oppo- "site *white spots before the apex, frequently united into a fascia*; cilia grey, at the "apex whitish. (In the female the entire base of the wing is white, with the ex- "ception of a grey streak along the costa.) Posterior wings grey, with paler cilia.

"Common on bogs and mosses in June and July; on the summit of the hill "above Kilmun it is extremely plentiful, flying freely in the afternoon, threading its "way between the stems of grass or rushes, and occasionally settling for an instant."

The above description was written after studying the long series of specimens which I collected at Kilmun when stopping there for ten days in July, 1850, as is duly recorded in the second edition of the "Entomologist's Companion." At that time the insect had not been bred, and it will be observed, that the first fascia is spoken of as *nearly straight*, and not a word said about *its being obsolete towards the costa*, and the two spots beyond the middle are said to be *frequently united into a fascia.*

These characters, to which I am now calling attention, are the very points which serve to distinguish *Kilmunella* from some of the species most closely allied.

After that portion of the "Insecta Britannica" volume was printed, I bred, at the end of July, 1854, several specimens of an *Elachista from larvæ found by* Mr. John Scott at Fochabers mining the leaves of a species of *Carex*. I find in my Diary, that as the males emerged I did not seem to recognise them, as they are only entered *Elachista* (without any specific name); but when the female made its appearance, I seem to have jumped to the conclusion that I recognised it, as I entered it at once as *Elachista Kilmunella*, and thenceforth it would appear that I had too hastily assumed that the males were also *Kilmunella*, though differing somewhat from my caught specimens, as perhaps was to be expected in bred specimens.

But much mischief arose from this mistake, for the very next description I wrote of *Kilmunella*, I modified it in accordance with my bred specimens.

In 1858 appeared in the "Transactions of the Entomological Society of London," vol. iv, new series, my "Synopsis of the genus *Elachista*," and there, at p. 301, is the following description of *Elachista Kilmunella*:

> "Most nearly allied to the preceding [*E. atricomella*], but distinguished by the duller, blunter anterior wings, the fascia being often obsolete towards the costa, and the opposite spots duller and more nearly opposite. *Airæ* is a blacker insect, and the fascia is altogether more indistinct.
>
> "Expansion of the wings, 4½—5 lines. Head dark grey: anterior wings dingy dark grey, with a nearly straight whitish fascia before the middle, frequently obsolete towards the costa, and two opposite whitish spots towards the hind margin, that on the costa being rather posterior.
>
> "In the female, frequently the basal portion of the wing is suffused with whitish, especially along the inner margin.
>
> "The larva, which is yellowish-grey, mines the leaves of a *Carex* in April and July.
>
> "The perfect insect appears in June and August, and occurs in various parts of Scotland, and in Lancashire."

It is evident in the above description, that the tendency of the first fascia to be *obsolete towards the costa* is something quite novel, which we seek in vain in the earlier description; moreover, more stress is laid upon the *posterior position of the costal spot* than had hitherto been done.

It may seem a self-condemnatory opinion, but the description reads to me as if that of *Kilmunella* had been carefully adjusted to fit the newly bred specimens, which perhaps, after all, may turn out to have been a totally distinct species.

Unfortunately, when I supplied von Heinemann with specimens as *Kilmunella*, it is very probable I sent him some of my *bred* specimens, and if these were not the veritable *Kilmunella*, it would tend *to increase the confusion.*

Mr. John Sang, of Darlington, who has been working very diligently at this subject for some time, has lately sent me such an accumulation of evidence, that I have no alternative but to surrender at discretion. Mr. Sang forwarded me six specimens bred from *Carex* (5 ♂, 1 ♀), along with twelve captured specimens of the same species, and, by the side of the latter, twelve of what he considers the ordinary *Kilmunella*, taken on the moors at the end of June and in July, and he pointed out that "the *Carex* feeder is brown, not grey, and the "fascia in the ♂ is distinct on the dorsal margin, but becomes almost "obsolete towards the costa. The position of the spots is curious, the "dorsal spot pointing inwards and the costal spot outwards; whereas, "in *Kilmunella*, the two spots either form a slightly angulated or a "slightly sinuous fascia, and the first fascia is distinct to the costa, so "that the insect appears to have two fasciæ. The cilia in *Kilmunella* "seem to me much whiter. The wing of *Kilmunella* is decidedly more "truncate looking. The bred insect can only have one brood: I bred "the ♀ as late as the 23rd August."

Mr. Sang describes the habit of the larva as follows:

> "The larvæ mine the long (old) leaves of *Carex riparia*, no doubt beginning in "the autumn and feeding most of the winter, making a narrow, indistinct, pale mine, "with no sign of 'frass' in it; very like that of *E. luticomella* in *Dactylis*. When "it comes to the lower end of the leaf, it enters the stem, goes down to the top of "the root (*not* into it), and then up and down till full fed, by that time having "hollowed out a gallery of considerable width with much soft brown 'frass' in it; "very like the work of an internal-feeding *Noctua* larva."

The next question that will arise is this: if the *Carex* feeder be distinct from the original *Kilmunella*, has it ever been named and described?

Long ago, I described an insect in the possession of the late Mr. Edleston, of Manchester, under the name of *Elachista alpinella*; but in the Entomologist's Annual for 1855, p. 56 (2nd edition, p. 78), I said (after noticing that *Kilmunella* had been "bred from larvæ found "by Mr. Scott in a species of *Carex*, near Fochabers, Banffshire") "I am inclined to think that *E. alpinella*, I. B., p. 254, is only a form "of this species;" and, subsequently, I sunk this *alpinella* altogether as a synonym of *Kilmunella*, which I well remember now was not at all satisfactory to Mr. Edleston.

The description given in the "Insecta Britannica: Lepidoptera Tineina," p. 254, is as follows:

> "*Alpinella*, Edleston *in lit.* Alis anticis fuscis, maculis *tribus indistinctis* albidis, "*una dorsali ante medium*, secunda ad angulum analem, tertia costali ante apicem; "*capite fusco.* Exp. al. 4½ lin.

"Head, face, and palpi fuscous. Antennæ fuscous. Anterior wings fuscous, "with *three indistinct* whitish spots, one on the inner margin before the middle, "one at the anal angle, and one rather beyond it on the costa; cilia pale fuscous. "Posterior wings grey, with paler cilia.

"Taken by Mr. Edleston, on moors near Manchester, in August."

The *fuscous* colour, the fact of the first fascia being so abbreviated to be spoken of as a *spot*, and the position of the two spots (so far as it is given, for nothing is said of the direction in which they point), all rather seem to indicate here the species which has been bred by Mr. Sang from *Carex*, but to me the description made from caught and worn specimens is too unsatisfactory to make it desirable to retain the name of *alpinella*, and, fortunately, in Wocke's continuation of von Heinemann's work on "Die Schmetterlinge Deutschlands und der Schweiz," at p. 495, we have an *Elachista monticola*, Wocke, described, which to me seems quite applicable to Mr. Sang's insect, except that the ground colour is given as black. I translate the description, as follows:

"*Monticola*, Wocke. Anterior wings broader posteriorly, black (with the basal "portion paler in the ♀), with slightly curved or angulated white fascia (much "broader in the ♀), and two opposite hinder spots obliquely placed, cilia grey, with "a line of black scales before the middle; head of the ♂ black-grey, of the ♀ whitish. "Length of wing, 2—2¼ lines (4½ times as long as broad).

"Near to *Kilmunella*,* the anterior wings narrower at the base, with the hind "margin more oblique, darker, less glossy, the fascia in the ♂ likewise narrow, ob- "tusely angulated in the middle, above the fold more or less obsolete, in the ♀ broad, "but with the edges ill-defined, not so much angulated as very faintly curved. In "the ♀ the colour of the basal portion of the wing varies considerably, sometimes "owing to scattered whitish scales it is only a little paler than the rest of the wing, "or it is only whitish or brownish-white along the inner margin, and sometimes, as "in *Kilmunella*, it is entirely whitish, only with a greyish tinge along the costa and "in the fold, and then, as in that species, the pale portion runs into the fascia. The "opposite spots are more or less triangular, smaller and narrower in the ♂, broader "in the ♀, the dorsal spot points to two-thirds of the costa. Cilia paler grey, "scarcely paler towards the apex, thickly scaled with black at the base, the dividing "line thick, likewise far from the ends of the cilia.

"Posterior wings half the breadth of the anterior wings, dark grey, the cilia "more than three times the length of those of the anterior wings.

"The head of the ♂ almost black, with the face scarcely paler, in the ♀ dirty "white, only on the neck rather grey. The palpi internally of the colour of the face, "externally grey, darker in the ♂, the abdomen and the legs as in *Kilmunella*.

"On the Upper Harz, from the middle of July, the larva in June in the stems "of *Carex fulva*, mining into the root."

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* *It must be borne in mind as being very doubtful which species I actually sent to v. Heinemann as Kilmunella.*

Wocke quotes as a doubtful synonym to this, the ***helvetica*** of Frey, of which he says "it seems to belong here; worn specimens of
" *monticola* are just as pale."

Immediately before *monticola*, Wocke describes Frey's ***stagnalis***, which occurs on mountain moors in Bohemia and in the Harz at the end of June and the beginning of July, and if not already in our collections, is extremely likely to occur with us. I therefore translate the description:

" *Stagnalis*, Frey, L.E., 13, 316. *Kilmunella*, Nolcken, 705. *Turfosella*,
" Heinemann *in lit.*

" Anterior wings black-grey, with a white fascia and two hinder spots placed
" almost exactly opposite; cilia dark grey, at the apex white-grey, with a black
" dividing line beyond the middle, before which they are dusted with black; the
" head dark grey. Length of wing, 1¾—2 lines (4 times as long as broad).

" Smaller and shorter winged than the allied species, recognised by the whitish
" colour of the cilia beyond the dividing line and below the apex of the wing.

"Anterior wings pale grey, the ♀ with the basal portion sometimes rather paler,
" but only slightly so, the fascia beyond one-third of the length of the wing, entire,
" whitish, narrow, in other respects rather variable, sometimes quite perpendicular,
" sometimes from the fold to the costa inclining towards the base, or with a blunt
" angle in the middle pointing posteriorly; the opposite spots as far from the fascia
" as the latter is from the base, exactly opposite and pointing towards each other,
" almost forming a second straight fascia nearly parallel to the first, though with a
" slender interruption in the middle, where, however, there is frequently a more or
" less distinct fine angulated marking as a connecting link, as in *poæ*. Cilia dark
" grey, the dividing line not far from the tips, previous to this line they are rather
" thickly dusted with dark scales.

" Posterior wings half the length of the anterior wings, black-grey, with paler
" cilia, which are yellowish at the base.

" Head dark grey, the face in certain directions paler, palpi moderately long,
" grey, internally yellowish-white, abdomen and legs grey, the former in the ♂ with
" a long pale ochreous-yellow-grey anal tuft, the hinder tibiæ from the base to the
" middle spurs yellowish-white.

" On the high moors of the Sudetic Mountains, and the Upper Harz, at the
" end of June and beginning of July.

" Nolcken mixes this species (*turfosella*) with *monticola* (formerly *montana*,
" Hein. *in lit.*), his notices suit especially to the former, and I also possess two males
" from him which leave no doubt. The distinctness of the two species is proved with
" certainty, from the different mode of life of the larva and the food-plant (I once
" bred *stagnalis* from the leaf of a *Carex*), also, though both fly on the Harz in
" neighbouring localities, they do not fly together and are out at different times."

I may be dull of comprehension, but I confess I do not quite follow Wocke as to "the different mode of life of the larva and the
" food plant;" both feed on *Carex*—only *monticola* is said to mine the *stem*, *stagnalis* the *leaf*. Is that the great distinction? Mr. Sang's *larva first mines* the leaf and then the stem.

Between the descriptions above quoted of *stagnalis* and *monticola* a description is introduced of *Kilmunella*, which must have been made from some specimens with which I had supplied von Heinemann, as Wocke says "it has not hitherto been detected on the continent."

He describes this *Kilmunella* as follows:

"Anterior wings of uniform breadth from the base, rounded posteriorly, dark "grey, with a faint violet-red gloss. The fascia in the ♂ narrower and indistinct, "rather variable, perpendicular and straight or slightly angulated, often broken in the "middle, in the ♀ the entire basal portion is whitish, only tinged with grey on the "costa and in the fold, and passes without any defined separation into the fascia, "which is posteriorly quite straight and perpendicular. The opposite spots are "rather large, somewhat variable in form, usually triangular, the costal spot points "towards the anal angle, the dorsal spot towards the middle of the costa. Cilia at "the base dusted with dark grey, from the apex to the middle of the hind margin "whitish, below this rather dark grey, the dividing line is far away from the tips of "the cilia.

"Posterior wings half the breadth of the anterior wings, the cilia more than "three times the length of those of the anterior wings.

"Head and the rather long palpi in the ♂ dark grey, in the ♀ pale grey; legs "and abdomen dark grey, the latter in the ♂ with the anal tuft of the same colour, "in the ♀ with narrow pale margins to the segments; the hinder tibiæ spotted with "whitish before the middle.

"From Scotland."

To put the whole matter in few words, thus:

Kilmunella is grey, and has an entire fascia before the middle, and then an angulated fascia formed of two opposite spots.

Monticola is brown, and has the first fascia obsolete towards the costa, forming only a dorsal spot, and the hinder spots look in contrary directions and do not form a fascia.

Stagnalis, which we have not yet distinguished amongst our British species, should be smaller and shorter winged, with the first fascia entire and the opposite spots almost forming a straight second fascia, the apical portion of the cilia whitish.

Mountsfield, Lewisham:
October 20th, 1878.

Heliothis peltigera at Hereford.—The notice of *Heliothis peltigera* occurring at Tenbury reminds me that I captured a specimen in my garden here last summer. I believe *its occurrence in Herefordshire* has not previously been recorded.—T. A. *Chapman, Binghill, Hereford: December 3rd*, 1878.

NOTES ON LARVÆ OF SOME *PHYCIDÆ* (KNOT-HORNS).

BY C. G. BARRETT.

The larva of Homœosoma sinuella, Fab.—For two or three years I have been on the look out for the larva of *Homœosoma sinuella* in its favourite localities on the coast, and once, finding unmistakeable *Homœosoma* larvæ in flower-heads of *Carduus lanceolatus* in one of these localities, was much surprised at rearing *H. binævella*, which I had never seen there. In the summer of 1877, I casually noticed that some very tall plants of ribwort-plantain (*Plantago lanceolata*) were much frequented by *H. sinuella*; specimens were running up the long flower-stalks to take flight (a position in which the long strong legs and compact longicorn-like form of the moth were strikingly exhibited), but as this only led me to examine the *seed-heads* of the plantain, no results followed. However, in February last, when searching for *Dicrorampha* larvæ along the undercliffs, I came upon these large plants of ribwort-plantain, and determined to give them a thorough examination, and, in the solid root-stocks (from which proceed the fibrous roots), I found larvæ, which, from their appearance, I was disposed at the time to refer to some *Tortrix*, but which soon began to spin themselves tough, soft, silken cocoons, which became in time of a sooty-black, within the cavities in which the larvæ had lived, and they remained unchanged for at least four months. Other larvæ continued, apparently, to feed much longer, but, at the end of March, most of them were in cocoon, and, early in June, they began to assume the pupa-state. The first moth emerged from these on June 17th, and they continued to come out all through July; but, in their favourite haunts on the warm slopes of the cliffs, specimens were flying at the beginning of June. When examining the plants in March and April, I was surprised to find how small and stunted a root-stock would serve to contain a larva, and in the larger roots to find two or three cocoons in one cavity. At the same time, although portions of the plants were killed, fresh vigorous shoots were growing from the sides, and these became after a while so luxuriant that it was difficult to find the pieces of old root-stock in which the larvæ had fed, and were then in pupa.

On the 4th September, I again examined the plantains and found young larvæ at work, some of them indeed being well grown and actually *larger* than those I had found in the winter, and that they now bore much more the appearance of *Homœosoma* larvæ. At this time, in *what may be called its active* state of existence, the larva is, when at rest, short and very thick, but it nearly doubles its length when crawling, though the hinder part is still thick, and sometimes very "baggy." Segments rather deeply divided, and having transverse folds on the skin, the third and fourth segments having each *two* of these folds, which nearly meet at the back and look like cross diagonal lines, while the remaining body-segments have each one fold in the middle. Colour dull porcelain-white, with a faint bluish tinge when full grown, darker between the segments; the sub-dorsal lines and spiracles indicated by depressed dots. Head deeply lobed, light chestnut, jaws brown, dorsal plate pale brown, dotted along its posterior margin with black, anal plate pale brown, anterior feet black. Eating the inner substance of the root-stock of *Plantago lanceolata*, living entirely in the cavity thus formed, its presence only slightly indicated by the drooping heart leaves. By the winter, however, although it seems still to eat a little from the walls of its cavity, it has shrunk considerably, the obesity of the posterior portion having quite disappeared. It is now short, thick, and very sluggish, dull white, the third to fifth segments rather more transparent, dorsal vessel visible, head and dorsal plate light brown, darker at the edges, anal plate and legs as before, and while in cocoon it only becomes slightly yellowish. It varies excessively in the time of spinning this cocoon—from September to March apparently—and the cocoon is not black at first, but from whitish becomes brown, and finally sooty. Pupa light chestnut, dorsal region paler.

Dr. Hofmann, in his "Kleinschmetterlingsraupen," describes the larva of *sinuella* (from Treitschke and Hübner) thus:—"Light bark-"brown, with white longitudinal stripes, head brown spotted with "black, dorsal plate black. In September, on *Chenopodium*."

Clearly this description does not refer to our insect.

The larva of Homœosoma binævella, Steph.—This is to be found in the middle of August in the flower- and seed-heads of *Carduus lanceolatus*, eating the young seeds and excavating a large cavity in the solid substance at the base of the flower-head, in which cavity it lives. When full-fed, it leaves the head and spins a tough brown cocoon among rubbish, in which (like the allied species) it remains unchanged through the winter and spring. Several of the moths emerged in the third week in July.

This larva is stout, more particularly at the posterior extremity, very pretty, pale green, paler beneath, with pink dorsal and sub-dorsal stripes, spiracular stripe also pink but interrupted, each segment deeply wrinkled below the spiracles. Head bright chestnut, dorsal plate greenish in front, pale brown behind, anal plate blackish.

But here again is a discrepancy.

Hofmann quotes Von Hornig's description of the larva of *binævella*, H.-S.:—"Dirty reddish-grey, with dark brown dorsal stripe, two "small black dots on each segment, and interrupted dark brown longi-"tudinal stripes. Head dark brown, the dorsal plate somewhat darker "divided by a paler line. In *May and June*, in the heads of *Carduus* "*acanthoides*."

Clearly we have more to learn about these species!

The larva of Rhodophæa advenella, Zincken.—On June 6th, I beat an exceedingly pretty larva from hawthorn: cylindrical, moderately stout, light pea-green, with bright purplish-pink sub-dorsal stripes, head pale brown, eyes darker, plates green, the purple-pink stripes being continued upon the dorsal plate. It spun a tough silken cocoon attached to a dead leaf, in which it became a chestnut-brown pupa, and, after lying in pupa about a month, the moth emerged on July 15th.

The description of this larva, quoted by Dr. Hofmann from Zincken and Treitschke, is:—"Naked, spindle-shaped, of a beautiful "green, with red-brown lateral lines, head red-brown. In May and "June, in the flowers of Hawthorn. Pupating in the earth in a "*slight* web."

The larva of Rhodophæa consociella, Hübner.—In the middle of June last, Mr. Hodgkinson sent me a few larvæ of this species, found by him at Arnside. They were not active; cylindrical, with rather long delicate bristles, very pale greenish-grey with dark green-grey dorsal, and two sub-dorsal, stripes. Head and dorsal plate large, pale yellowish-brown with grey dots, the plate being semi-circular in form, anal plate hardly distinguishable. Drawing together leaves of oak, gnawing away the under surface and making a dense web among them. Pupa light brown, in a silken cocoon, covered with frass, and fixed to the surface of a leaf or to the web.

I remember similar larvæ in the south of England, and, as they have been before described and are well known, am only induced to note these particulars because Prof. Zeller has described the larva, in the "Isis," as:—"*sulphur-yellow*, with fine *brown* longitudinal lines and "small black raised dots." The other particulars agree so well that I think the larva of this species must vary considerably in colour.

The larva of Ephestia cinerosella, Z. (*artemisiella*, St., Man.).—I found larvæ of this species in the stems and root-stocks of Artemisia *absinthium* in the winter and spring, and reared a fine series from June 29th to July 27th. This larva and its habits have been so well described by Mr. Buckler (E. M. M., vol. ix, p. 143), that I need only remark the satisfactory fact that the destructive Ichneumon, mentioned by him, seems here to be either very scarce or totally absent.

Pembroke: *October 8th*, 1878.

ON *EUDROMUS*, FAMILY *CARABIDÆ*.

BY H. W. BATES, F.L.S.

The genus *Eudromus* of Klug, the most remarkable development of the *Pterostichus* or *Feronia* type of *Carabidæ* known at present, has been treated by recent systematists with unmerited depreciation. To cite the two chief instances: Lacordaire, in his "Genera," sinks it in the general crowd of synonyms, under the genus *Feronia*, without a word of comment; and Harold and Gemminger make it a synonym of the Australian group *Homalosoma*, increasing the indignity by giving "Nov. Holland," as the locality of its two described species. In this way, has been buried out of sight the important biological fact that Madagascar has developed, in addition to its many other remarkable animal forms, a special group of the world-wide *Feroniæ*, carrying the type to the highest degree of perfection as regards size, and grace of form and sculpture.

The chief authority on this family, Baron Chaudoir, has, as far as I can gather, only once had occasion to allude to the genus. This is in his description of the allied Australian group *Homalosoma*, in the Bull. Moscou, 1865, iii, p. 64, where he points out the remarkable character of the short, broad, and rounded scutellum, as distinguishing *Eudromus* from *Homalosoma*. Klug, in founding the genus (Wiegmann's Archiv, 1835, i, p. 384), gives a detailed generic diagnosis. But neither of these authors makes mention of the length and slenderness of the legs and antennæ, which amply distinguish the Madagascar group, not only from *Homalosoma*, but from all other genera of *Pterostichinæ*, and even from the *Sphodrinæ*, with which Baron Chaudoir is inclined to perceive some near affinity, when speaking of *Homalosoma*. Taking then the characters derived from the scutellum (latissimum, breve, postice rotundatum), the antennæ (graciles, thoracis basin longe superantes), and the legs (elongati, præcipue tarsis gracilibus, posticis articulo primo valde elongato), added to the length and slenderness of the palpi, the last joint of which is compressed, and more or less dilated towards the apex, and the striated mandibles,—*Eudromus* may be taken as a perfectly well-defined generic group in this sub-family. The short and broad scutellum, it shares in common with *Eucamptognathus* and *Oodinus*, two other fine Madagascar genera of the same group. In the degree of slenderness and character of clothing of the under-surface of the tarsi, there is considerable difference amongst the species, as there is also in size and sculpture; but in all, the elytra are ribbed and more or less obliquely truncate and toothed at the apex.

I have had the opportunity of examining four distinct species of this fine genus. They appear to inhabit the central plateaux and mountains of Madagascar, but nothing has yet been recorded regarding their habits. Judging from the length of the legs, they must have great powers of running, and it is probable that many more species remain to be discovered.

1. EUDROMUS STRIATOCOLLIS.

Feronia (Omalosoma) striatocollis, Brullé, Hist. Nat. des Ins., iv, p. 364 (1834).

Eudromus alternans, Klug, Wiegm. Arch., 1835, i, p. 384, t. 6, f. 2, *c. d.*

My specimen (♀) measures 1½ in. (18 lines) in length. Brullé's appear to have been a little larger (20 lin.). Klug gives 17—20 lin. The species is distinguished by the opaque, minutely sculptured surface of the thorax and elytra; the thorax being covered with fine transverse striæ.

2. EUDROMUS LÆVICOLLIS.

Feronia (*Omalosoma*) *lævicollis*, Brullé, *l. c.*, p. 365.

Measures 1 in. 10½ lin. Brullé's example, taken by M. Bernier, and deposited in the Museum d'Histoire Naturelle, is nearly of the same size as mine. Distinguished by its nearly quadrate and smooth polished thorax. The elytra are less opaque than in *E. striatocollis*, although covered with a similar minute scuplture, consisting of excessively fine striæ, on ribs and interstices alike. The ribs are six on each elytron, the alternate (2nd and 4th) rather higher, and the 6th or submarginal one much elevated, extending to the sutural apex, and receiving the 2nd and 4th at their termination.

3. EUDROMUS TRISULCATUS, *n. sp.*

Latior, elytris utroque sexu gradatim dilatatis. Niger, sericeo-nitens: thorace quadrato, lateribus anticis rotundatis, posticis sinuatis; dorso sulcis tribus lævibus, latis, profundis, marginem anticum haud attingentibus: elytris utrinque tri-costatis, interstitiis lævibus, apice oblique truncato, apice suturali ♂ obtuso, ♀ *triangulariter emarginato.* Long. 1 in., 10½ lin. ♂ ♀.

The elytra have scarcely any traces of the minute striæ which distinguish the two preceding species, and have only three costæ on each; the interstices being broad and quite free from punctures or elevated lines. The upper edge of the truncature of the elytra is subdentate.

4. Eudromus emarginatus, Putzeys.

I have received from Dr. Baden a pair of a small and very distinct species under the above name, but I have not been able to find a published description of it. It measures 13 lin. The thorax has traces of transverse striæ, especially behind, but is otherwise smooth and polished; it is more quadrate in outline than the other species, and the hind angles are more obtuse. The elytra are minutely strigose only in the interstices; the costæ, six in number, besides a slender 7th or submarginal one, are narrow, the 1st, 3rd, and 5th, however, become obsolete before reaching the apex, and the latter, in the ♀, is strongly tridentate. The soles of the tarsi are clothed with long, reddish, stiff hairs.

Bartholomew Road, Kentish Town, N.W.:
December, 1878.

DESCRIPTION OF A NEW SPECIES OF *SIDERODACTYLUS*, INJURIOUS TO GRAPE VINES (IMPORTED FROM THE CAPE OF GOOD HOPE) IN THE ISLAND OF ASCENSION.

BY F. P. PASCOE, F.L.S.

Siderodactylus ornatus, *n. sp.*

Head and rostrum rather broad and depressed, speckled with small golden-green scales; antennæ long and very slender, the second joint of the funicle more than twice as long as the first; prothorax round, convex above, black, the anterior margin and sides densely covered with yellowish metallic scales, two large oblong spots composed of similar scales behind; elytra copper-brown, depressed, widest behind the middle, the apex rounded, longitudinally punctured, and, when viewed sideways, transversely wrinkled, the outer margin posteriorly with golden-green scales; anterior femora glossy black, tibia and tarsus passing gradually into pale brown, the former curved and having six or seven well-marked denticles on its inner border; intermediate and posterior legs testaceous; all the tarsi pubescent; body beneath black, the sides speckled with golden-green scales. Length, 4¼ lines.

Siderodactylus is amongst English genera most allied to Tanyme-

cus; its long anterior legs, however, and their tumid femora, together with the oval shoulderless elytra, give it a different aspect. The species described above is about the size of *S. puberulus*, Boh., but, among many other points, its diversely coloured legs will distinguish it from its rather limited number of congeners (16), two or three of which are still undescribed. As in many other genera differentiated by well-marked characters, the relative length of the joints of the antennæ is, in *Siderodactylus*, only of specific importance.

1, Burlington Road, Westbourne Park :
December, 1878.

[This beetle formed the subject of a communication from the Lords of the Admiralty to Kew. It is stated to be doing much damage to grape vines by eating the leaves, and also to attack the plants of kohl-rabi.—R. McL.]

DESCRIPTION OF A NEW GEODEPHAGOUS BEETLE, OF THE FAMILY *SCARITIDÆ*.

BY GEORGE LEWIS.

MOUHOTIA BATESI, *n. sp.*

Nigra, prothoracis margine laterali basalique et elytrorum margine laterali late cupreis : elytris striato-punctatis, integris, interstitiis crenatis. *Long.* 1⅞ *lin.*

This species is much smaller than *M. gloriosa*, Cast., being only one inch and seven-eighths in length, inclusive of the mandibles, and is conspicuously different in the elytral striæ, which are much deeper and extend throughout the whole of the wing-case ; while in the older species the region of the scutellum is comparatively smooth.

Two specimens of this insect have been received from Burma, and it will probably form the most northern type of the genus. I have dedicated this species to my friend Mr. H. W. Bates, whose careful descriptions of, and interesting geographical remarks on, the *Geodephaga* and *Longicornia* of Japan, first attracted the attention of the public to the fauna of these eastern islands.

3, Green Street, Grosvenor Square :
17th December, 1878.

Variety of the larva of Abraxas grossulariata.—At a meeting of the Huddersfield Scientific Club, held on the 14th June last, Mr. S. L. Mosley showed examples of a remarkably dark form of this larva. He had received them from Mr. J. E. Robson, of Hartlepool, who wrote him that a colony of the form usually occurred there. Mr. Mosley kindly gave me one of them, which I preserved. It differs from the strikingly marked usual form in being almost uniformly sooty-black: there is no trace of the reddish lateral stripe below the spiracles; and the yellow, or cream colour, only shows a little on the second segment, and on the ventral area as a narrow central stripe, interrupted, except between the legs and pro-legs, at the segmental divisions. The only other markings are two small pale spots on the *front* of segments 5, 6, 7, 8 and 9, and laterally on segments 10 and 11. The appearance altogether is so different from the usual form, that at first sight I had no idea what the larvæ were; and on placing my preserved specimen in the cabinet along with the broad black bordered variety of the imago, it seemed to correspond with it exactly. Unfortunately for that theory, however, these black larvæ at Hartlepool only produce the most ordinary form of the imago.—Geo. T. Porritt, Highroyd House, Huddersfield: *December 5th*, 1878.

Description of the larva of Tinea orientalis.—Since the description of the imago in the November number (see *ante*, p. 134), I have succeeded in discovering the larva, which was exhibited at the East-London Entomological Society, on 27th November. I have described it as follows:—Length about 8 lines. Colour dirty whitish, shining, no perceptible hairs; head reddish-brown; 2nd and 3rd segments yellowish on the back, sides whitish, overlapping and swollen, giving the larva the appearance of having a hood; dorsal vessel blackish; legs reddish. The larva feeds in a very tough silken case, in buffalo horn, making galleries quite through the horn. On a future occasion I hope to be able to give a description of the pupa.—C. W. Simmons, 8, Gough Street, Stainsby Road, Poplar, E.: *November 28th*, 1878.

New British species of Phycidæ.—I have much pleasure in recording the capture of a species of knot-horn new to Britain, which I identified, by examination of the foreign collection in the British Museum, as *Euzophera oblitella* of Zeller. The following is a description of the one specimen I captured:—Front wings greyish, dusted with darker; both lines black, the first preceded, the second followed, by a pale band; nearly midway between the two is a conspicuous black spot; near the base, and almost touching the costa, is another black spot; hind wings pearly-grey, gradually darkening to the hind margin. Expanse of wings, 8 lines.

The specimen is in beautiful condition, and was taken on the south-west coast of the Isle of Wight in the autumn of 1876. I have not identified it until lately.

There is only one specimen in the British Museum Collection. In Staudinger's Catalogue, Hungary, Sarepta (South-East Russia), South France, Andalusia, and Sicily are recorded as localities.—J. B. Blackburn, care of Rev. J. Buckmaster, The Vicarage, Wandsworth: *27th November*, 1878.

[The insect above mentioned was first described by Zeller in the Isis of 1848; he then placed it in the genus *Ephestia*, near *interpunctella*; now it is referred to the genus *Euzophera*, and its nearest allies, known to us as British species, are *E. pinguis*, *Haw.*, and *E. cinerosella*, Z. (*artemisiella*, Stn.).

The generic name Euzophera appears in the Stettin. ent. Zeitung, 1867, p. 377, as a substitute for Heinemann's name *Stenoptycha*, which he himself threw down (Schmett. Deutschlands u. der Schweiz., Zweite Abtheil. Band i, Heft ii, Zünsler, p. 209) as having been already employed for a genus of *Pterophoridæ*. One peculiarity of the species on which stress is laid both by Zeller and Heinemann, though Herrich-Schäffer makes no mention of it, is a yellowish-brown dorsal spot on the inner edge of the first fascia. On reading Mr. Blackburn's description I felt doubtful whether his insect was truly Zeller's *oblitella*, and having expressed a wish to him to see the insect, he kindly brought me the specimen, and I have to-day had an opportunity of leisurely examining it. This dark dorsal blotch is decidedly visible, though not very evident, but readily to be found if looked for. The two pale fasciæ have both a dentate or jagged appearance (Herrich-Schäffer says "fein gezackt"). The central spot, described above as a "conspicuous black spot," also puzzled me, for Herrich-Schäffer says "der Mittelfleck unbestimmt," but Heinemann evidently implies that the insect varies in the distinctness of this marking—it consists of two spots, the lower one being the more distinct and being that noticed by Mr. Blackburn. Heinemann says of this central spot "bisweilen fehlt es oder doch der obere Punkt," and hence, if one or both spots are liable to disappear, there is room for considerable variation.

It will be seen from the above that I have abundantly confirmed the correctness of Mr. Blackburn's determination of the species, and I need only further add that his specimen is quite as fine as if it had been bred.—H. T. Stainton, Mountsfield, Lewisham: *December* 11*th*, 1878.]

On a new Depressaria hitherto confounded with the atomella of our cabinets.—In September last I received from Mr. Barrett a fine series of a *Depressaria* bred from *Genista tinctoria*, which at once attracted my attention; I had previously a single specimen of unknown origin of the same insect amongst my *atomella*.

On referring to what has been written latterly about these insects, I find that Dr. Rössler of Wiesbaden, in his "Schmetterlinge des Herzogthums Nassau," published in 1866, had, at p. 230, differentiated this *Depressaria* from that which stands as *atomella*, and had reserved to this *Genista tinctoria*-feeding species the name of *atomella*, giving to what we used to consider *atomella*, bred from broom, the name of *pulverella*.

Von Heinemann, in his "Schmetterlinge Deutschlands und der Schweiz," Zweite Abtheilung, Band ii, Heft. i, pp. 148, 149, confirms this separation of the two species, but uses the name *scopariella* for the broom-feeding species, and these are the names retained in Staudinger and Wocke's Catalogue, where *atomella* is not given as a British species, though now it has fairly established its claim to rank as such.

Under these two names I shall proceed to speak of them. *Atomella*, as far as we at present know, feeds only on *Genista tinctoria*; *scopariella* feeds on broom (*Spartium scoparium*), and, according to Rössler, also on *Genista pilosa*; I may mention, that the species which I bred from larvæ collected on *Calycotome spinosa* in the south of France, was *scopariella*. *Atomella* is a more gaily-coloured insect than *scopariella*—the anterior wings have the base and costal portion more yellowish, the other portions (especially towards the inner margin) more or less suffused with rosy. *Atomella* is a trifle shorter in the wing than scopariella, and the anal angle is more rounded, and thus the hind margin does not present so truncate an appearance as in *scopariella*. The difference in the larvæ is, I believe, not yet sufficiently made out. Rössler describes the larvæ of *atomella* as very pale grey-green, with shining black head and thoracic plate, the latter with a fine central line, but he makes no mention of the larva of the other species: von Heinemann describes the larva of *scopariella* as green, with three dark stripes and a reddish-green head.

Writing to Mr. Barrett on the subject, I called his attention to the fact that if we knew that both these descriptions were made from full fed larvæ, there was plenty of distinction, but that it was quite possible the larva of *scopariella* before the last moult might have a black head and thoracic plate, and if the larva of *atomella* described by Rössler was immature, it might assume a different appearance afterwards. Mr. Barrett, in reply, sent me his memorandum of the larva of *atomella* on *Genista tinctoria* as follows: "Cylindrical, exceedingly active and gymnastic. "Delicate pale pea-green, with narrow dorsal and broader sub-dorsal stripes all grey-"green. Spots small, black, hairs minute. Head and plates *pale yellow*."

Probably next season an opportunity will be taken to compare the two larvæ in their various stages of growth.—H. T. STAINTON, Mountsfield, Lewisham: *12th December*, 1878.

The Doubleday Collection.—I think I should not leave unnoticed the remarks of Mr. W. J. Vandenbergh, Jun., which appear in the E. M. M. for the present month, on my letter to the "Entomologist," for October, in reference to the request of the Trustees of the Doubleday Collection for fresh specimens of 238 species of *Lepidoptera.*

The remarks may be conveniently divided into two sections: 1st, that I should not have written on "questionable information"—which Mr. Vandenbergh considers I have done; and 2nd, that my letter has deterred entomologists from sending specimens to the Doubleday Collection.

As regards the 1st, I would point out that Mr. Vandenbergh could have seen from a catalogue of the Collection (if he had obtained one), and from my letter to the "Entomologist" (if he had read it carefully), that itwas on no "questionable information" that my letter was based—but on actual knowledge, obtained while collating the catalogue with the Collection. The catalogue (which was undertaken at my suggestion) was, I understood, but a preliminary to placing all mite-infested specimens under proper treatment. I spent many hours on each of several days at the Bethnal Green Museum in supervising the catalogue, and, for this purpose, I had the whole of the collection under my immediate notice, and I then predicted that very serious results would accrue unless energetic steps were taken to eradicate the mites by which so many specimens were attacked.

But if anything were wanting to show how foolishly Mr. Vandenbergh has accused me, and how well-founded my prediction was, the advertisement of the Trustees for 238 species furnishes it.

As regards the 2nd point—that I have deterred entomologists from responding to the request of the Trustees—I am obliged to Mr. Vandenbergh for the compliment he conveys, that I can influence entomologists so much, but must decline it. But Mr. Vandenbergh can scarcely be aware that nothing can be more deterrent than his *own communication. He tells* us there are "no signs of mites, grease, or any other *kind of neglect," not* even old or faded specimens, and that "the whole collection is in the most exquisite and unparalleled condition." Surely all this points to the fact that the specimens asked for by the Trustees are not needed. "Save us from our friends," may well exclaim the Trustees. But did not Mr. Vandenbergh know that, in August last, Mr. James English was appointed to go through the collection, "and put it in proper order?" (*vide* Trustees' advertisement).—A. B. Farn, Dartford: *4th December*, 1878.

Caprification of the sycamore fig—Correction of an error.—In the report of the Proceedings of the Entomological Society of November 6th (*vide ante*, p. 168), it was erroneously stated that the *Sycophaga crassipes*, Westw., was employed for the purpose of "caprification" on the sycamore fig of Egypt, in the same way that the *Blastophagæ* are applied to the domestic fig. No such process is adopted in the former case; but the Arabs, in lieu thereof, make an incision in each fig, either to promote maturity, or to prevent the figs from falling off (as is said to be the effect of caprification); and possibly also to get rid of the *Sycophagæ*, which crowd the interior of these figs, and which avail themselves of such aperture to escape; or otherwise they gnaw a series of small holes round the crown of the fig, which eventually falls in, thus affording a large space for egress. M. Lichtenstein's specimens of *Blastophaga* from Montpellier correspond with the *B. grossorum*, Gr., of Tyrol, the females of which are *jet-black*, with a very *short* oviduct; whereas, those of the *Cynips Psenes*, L., from Smyrna, are *rufous*, and their oviduct *twice* the length of the body.—S. S. Saunders, Norwood: *December 17th*, 1878.

The genus Vespa at Worcester.—Of our seven British species, five occur here within the parliamentary borough: *Vespa vulgaris* is, usually, plentiful; *V. germanica* is common; *V. crabro* occurs occasionally; *V. rufa* has occurred to me twice; *V. sylvestris*, several specimens visited a blooming *Scrophularia* in the garden this year. No more species of *Vespa* have been found by me in other parts of the county.—J. E. Fletcher, Happy Land, Worcester: *November 30th*, 1878.

Pyrus torminalis as a food-plant for insects.—The service-tree is disappointing from an entomological point of view, and seems to nourish only one species peculiar to it. The following list omits species not found by me. It will be seen that both the *Hymenoptera* and most of the *Lepidoptera* are hawthorn-feeders also, and that but few of the species occur in considerable numbers.

Hymenoptera:—*Eriocampa adumbrata* and *Dineura stylata*, of regular occurrence, but uncommon.

Lepidoptera:—*Rumia cratægata*, scarce; *Chimatobia brumata*, rather common; *Swammerdamia pyrella*, two or three found in a season; *Ornix anglicella*, not common; *Lithocolletis corylifoliella*, rather common; *L. torminella*, common; *Nepticula* ——— one larva found, mining a nearly straight gallery; *N.* ———, two larvæ found, mining a much contorted narrow gallery, crowded together near the foot-stalk.

? *Diptera*:—A few larvæ found, minute, mining indiffently either side of the leaf, making a small blotch, very faintly perceptible, of the filmy appearance presented by the mine of *Phyllocnistis suffusella*.—Id.

Migration of Aphides.—Dr. Kessler, of Cassel, writes to me, that after reading my "*Enquiries about Plant-Lice*," he sought for and found, in August, the winged *pupifera* of "*Tetraneura ulmi*" carrying back to the elms the "*Sexuata erostrata.*" This is a very interesting and long looked for discovery.—J. LICHTENSTEIN, Montpellier: *4th December*, 1878.

On the preservation of Aphides.—I had great pleasure in reading the note on Herr Schlechtendal's system of preservation of *Aphides* (p. 164 *ante*), and I think it may also be of interest to make known the method I use. Many years ago, seeing how well some fossil insects had been kept enclosed in amber or resin, I thought it might be possible to imitate this mode of preservation of soft-bodied insects, and I tried to do so by placing an insect on a drop of balsam on a piece of thin covering-glass of appropriate size, covering it closely with another piece of glass, and fixing the whole in a frame made with two pieces of card, but the experiment was not satisfactory.

Two years since I tried talc instead of glass: it is easy to cut with scissors, is nearly as transparent as glass, thinner, and not brittle. Then, by dissolving a bit of resin in spirit of turpentine, I make an artificial amber, a little brown in colour but sufficiently transparent for my purpose, and proceed as follows:—I put a drop on a square piece of talc, place my plant-louse thereon, and move it gently until it is completely immersed, by which time the legs and wings are generally extended in a proper position, then I put another square piece of talc on the top, and press on it a little until the liquid is well expanded and the insect is entirely surrounded. Then I take a frame of card and a similar piece of gummed paper, lay the prepared object on the former, and cover it with the latter, previously moistened, in order to hold all together, and, finally, I write the name, number, and page of my diary on the card, and pin the preparation in my cabinet. The whole proceeding takes only five minutes. The specimens answer perfectly for my biological studies; they have kept well for two years, and I believe will last at least as long as I shall. More care ought of course to be taken with specimens intended for embryological researches, but for a collection this method is quite sufficient. The number, say $\frac{23}{5}$, refers to the 23rd page of my diary, line 5, where I read—"*Pemphigus cornicularius*, Pass., winged "emigrant pseudogyne coming out of galls on *Pistacia terebinthus*, 8th Sept., 1878 (sent to J. W. Douglas)."—ID.

[The specimen M. Lichtenstein had the goodness to send is very effective as regards transparency, security, and doubtless also its durability. The compression that results from the nearness of the pieces of talc to each other, would, however, often be detrimental to the structure of the body of an insect, but this might be obviated if the insect were surrounded by a ring of thick card on which, instead of on the body of the insect, the covering piece of talc should rest.—J. W. D.].

The works of the late Professor Stål.—In the Ann. de la Soc. Ent. de France, p. 177 (1878), is an article by Dr. V. Signoret, entitled, "Notice sur la vie et les travaux entomologiques de Carl Stål," and I am indebted to the courtesy of Dr. Signoret for a copy of the paper, which, by giving an enumeration of all the late Professor Stål's entomological writings, will prove most valuable to Hemipterologists and other workers. The work of Stål, as thus catalogued, consists of 87 memoirs, the result of the labours of twenty-five years. His first paper, "Nya Svenska Hemiptera," appeared in 1853; his last publication "Systema Acridiodeorum," bears the date of the present year. In glancing over this list I have noticed one omission. 63,—"'Analecta Hemipterologica,' Berliner entom. Zeitschr. 1866 (not 1867), p. 387 à 393," is followed by a continuation in the same volume, p. 381 to 394, in which four new genera and ten new species are described. This Dr. Signoret appears to have missed in his labour of love in recording the works of his late friend, whose death is the greatest loss that systematic entomology has sustained for many years.—W. L. DISTANT, 1, Selston Villas, Derwent Grove, East Dulwich: *12th December*, 1878.

Review.

HEMIPTERA-HETEROPTERA NEERLANDICA. De inlandsche ware Hemipteren (land—en waterwantsen) beschreven en meerendeels ook afgebeeld door S. C. SNELLEN VON VOLLENHOVEN, J. U. et Ph. nat. Doct. Met 22 Platen, pp. i—xii and 1—368. 8vo. 'sGravenhage, 1878.

This work, of which only 100 copies are printed, is wholly in the Dutch language, and consists of descriptions of all the species of *Hemiptera-Heteroptera* hitherto known to inhabit Holland, arranged in systematic order and illustrated by the author. The genera employed are for the most part of old date, none being adopted since those of Fieber, and not many of them; which fact will be welcomed by entomologists of conservative and synthetical views, but in even a greater degree be displeasing and very surprising to the school of analytical subdividers. The names will often not be tenable,—some from being improperly applied, *e. g.*, *Cimex*, Linn., *Hydrometra*, Fab.; some from having been previously used, *e. g.*, *Pachymerus*, Lep.; some from the heterogeneous character of the species associated under them; and some for other reasons; but the student will soon rectify such matters. With regard to species, the descriptions are full and sufficient, but the record of the synonymy is marred by citing (with some exceptions) only authors and their works, giving the page, &c., where the species is described, but not the name under which it is described, although either in generic or specific appellation it often differs from that adopted by our author, which, recent emendations not being noticed, are frequently incorrect. There are no new species. The plates are in excellent style, the figures (comprising 239 species) being, with few exceptions, very characteristic; and the most of the slight deviations from strict accuracy are pointed out in the text. The work will be of great value to Dutch entomologists, and should incite them to greater efforts in collecting and studying *Hemiptera*, which appear to have been hitherto as much neglected in Holland as in most other parts of Europe. In Britain also the work should be appreciated, on account of the figures of many of our native species, which are not otherwise to be easily met with: and it should also have a special interest for us as showing the general community so far of the Hemipterous fauna of the two countries, notwithstanding the occurrence in Holland of some species rarely or never found in Britain. The curious thing is that a great many species indigenous to Britain are not found in Holland—the British being about 450 in number, whilst those here detected are only 250: rather an unexpected result, considering the geographical position of Holland on the continent (in the same latitude as our midland counties), and the narrow, insular separation of Britain therefrom. This proportion may, however, be varied when Holland has been better worked by Hemipterists, unless it should prove that its Hemipterous fauna is more limited than that of Britain by geological causes or surface conditions of vegetation and cultivation.

NOTES ON THE BUTTERFLIES OF PORT BAKLAR, TURKEY.

BY JAMES J. WALKER, R.N.

From the 24th February to the 15th August, 1878, H. M. S. "Swiftsure," was stationed in the Gulf of Xeros, at an anchorage near its eastern end, marked on the Admiralty chart as Port Baklar. This port is distant by land about twelve miles from Gallipoli, the road to that town passing through the famous "Lines of Boulair:" and about four miles, across the narrow isthmus of Gallipoli, from the Sea of Marmora. While here, in the "Swiftsure," besides collecting all the *Coleoptera* and *Hemiptera* I could find (which, although abundant enough in early spring, became very scarce after May), I paid a little attention to the *Lepidoptera*. A few hasty notes on the butterflies I observed within five miles of the port—seventy-four species in all—may be not devoid of interest; and these notes I preface with a brief description of the locality.

The landing-place at Port Baklar is on a sandy beach, backed by a strip of salt marsh, which gradually rises into low clay hills; on one of these, about two miles inland, stands the large and excessively dirty village of Boulair. Turning to the left on landing, and proceeding towards the head of the Gulf, ten minutes' walking brings one on to a range of low sandstone cliffs, about two miles in length; much of the land on the top of these cliffs is under cultivation as vineyards, &c., but there is a good and varied growth of flowers and herbage on their face, and in some sheltered chines are a few good-sized elms, poplars, and aspens, with clumps of thorny bushes and great festoons of honeysuckle, bramble, and *Smilax*; trees, though, are generally scarce throughout the district. Inland, the country becomes more hilly and broken, intersected by deep, narrow watercourses, the sides of which bear a good growth of bushes of various kinds: the most conspicuous feature in the scenery being the fine conical tumulus of Lysimachus, locally known as "Mal Tepé," from the summit of which, 790 feet above the sea-level, and more than 100 above the surrounding heights, a superb view of the Sea of Marmora and the Gulf of Xeros can be obtained on a clear day. This tumulus is about five miles from the landing-place, and I rarely went more than half-a-mile beyond it. It is, perhaps, worth noting that all except two (*Argynnis Daphne* and *Pyrgus malvarum*) of the butterflies hereafter mentioned, occurred on the two miles of cliffs.

My entomological solitude was, in July, enlivened by the company of Mr. G. F. Mathew, whose ship (H. M. S. "Cygnet") was then stationed at the Marmora end of the Boulair lines, and with whom I had more than one very pleasant excursion.

In the following notes, the names are those employed in Kirby's "Manual of European Butterflies;" the dates, when not otherwise specified, being those on which I first observed the insect.

Papilio Podalirius, L., April 21st (second brood, June 27th). Very common, flying gracefully round the tops of fruit trees, but easily caught. The green slug-like larva not uncommon on sloe-bushes; it emits a very strong but pleasant scent like ripe pears. *P. Machaon*, L., April 21st (second brood in July); common, in dry places and fallow-fields; varying much in size.

Thais cerisyi, G., May 12th; one seen by me on the cliffs, but (having no net with me) I did not catch it. *T. Polyxena*, W. V., May 2nd; one on the cliffs. Mr. G. F. Mathew found the larva commonly, at the end of June, on the Marmora side of the isthmus.

Aporia cratægi, L., May 12th; excessively abundant, both in the larva and perfect states; at the end of May, the butterflies could be seen, towards sunset, settled in companies of 40 to 50 on small twigs, from which, when disturbed, they rose in a perfect cloud, some of the ♀ singularly transparent, and almost scaleless.

Pieris brassicæ, L., June 2nd; rare. *P. rapæ*, L., May 2nd; common. *P. napi*, L., June 26th; rare. *P. Daplidice*, L., April 28th; abundant on the cliffs, and in waste places; fresh broods out in June and August.

Anthocharis Belia, Es., April 16th (second brood, June 6th); common on the cliffs and elsewhere. *A. cardamines*, L., April 12th; abundant in bushy places: smaller than average English specimens.

Leucophasia sinapis, L., April 12th; common throughout the summer, on the cliffs as well as in the ravines. *L. lathyri*, Hübn., April 16th. A "wood-white" butterfly, more slender and delicate-looking than even *sinapis*, and not rare in open places on the cliffs; seems to fit the description of *L. lathyri* in Kirby's "Manual" very well.

Colias Edusa, Fab., April, 14th: abundant, the ab. *Helice* occasional.

Gonepteryx rhamni, L., June 20th: scarce.

Melitæa Cinxia, L., May 2nd: very abundant on the cliffs in the larval and perfect states: some of the ♀ very dark: it was quite over by the end of May. *M. Phœbe*, Fab., May 18th (second brood of smaller specimens on July 23rd): common on the cliffs. *M. didyma*, Es., May 26th (second brood on July 23rd): common on the cliffs: the ♂ a very beautiful and conspicuous insect, from its rich, deep, fulvous-red colour: the ♀ very variable, many specimens being deep greenish-olive, with the black spots hardly visible. *M. trivia*, W. V., May 26th (second brood on July 4th); common on the cliffs; the larva not rare on species of *Verbascum.*

Argynnis Daphne, W. V., June 26th; not very scarce in a deep ravine beyond Mal Tepé, but very difficult to obtain, as it always kept well out of reach, among the brambles; only about four were caught. *A. Ino*, Es., June 29th; one worn specimen on the cliffs. *A. Lathonia*, L., June 27th; very scarce, on the cliffs. *A. Pandora*, W. V., May 30th; a few examples of this grand fritillary (which is common at Besika Bay) on the cliffs and elsewhere: it is exceedingly shy, and strong on the wing.

Grapta Ægea, Er., July 20th; not rare, sunning itself on bare rock-faces on the cliffs. *G. c-album*, L., June 14th; not unfrequent in lanes and bushy places.

Vanessa polychloros, L., June 2nd; common about elms for about three weeks. *V. urticæ*, L., July 19th; very rare. *V. Io*, L., June 23rd; only a few specimens observed. *V. Antiopa*, L., June 20th; not uncommon on the cliffs and elsewhere, for about a fortnight.

Pyrameis Atalanta, L., June 23rd; not very common. *P. cardui*, L., June 14th; excessively abundant everywhere.

Limenitis Camilla, W. V., May 26th; very plentiful along the cliffs, and in the ravines, wherever the honeysuckle grew; a most exquisite insect when in fine condition. Three broods during the summer.

Melanagria Galathea, L., June 6th; abundant: the specimens small and very dark, nearly all the marginal white spots being obliterated. *M. Larissa*, H., June 1st; abundant: varying much in size and colour.

Lasiommata Roxelana, Er., June 2nd; abundant in shady places: a very weak flier, but provokingly fond of ensconsing itself in the most brambly corners, to the great detriment of the net: worn ♀ stragglers occurred as late as August 15th. *L. Megæra*, L., April 14th; abundant.

Hipparchia Proserpina, W. V., July 6th; one specimen only (a ♀) of this fine insect, on a bramble-blossom on the cliffs. *H. Hermione*, L., July 11th; rare on the cliffs. *H. Briseis*, L., June 25th; very common in dry, open, flowery spots, and fond of the blossoms of the wild thyme: active and wary. *H. Semele*, L., June 6th; rare, on the cliffs. *H. statilinus*, Hf., July 16th; very abundant on the cliffs. *H. Janira*, L., May 25th; generally abundant. The var. ? *Eudora*, Esp., frequent in vineyards, &c., on the cliffs: first seen July 17th. *H. Tithonus, L., July 14th*; very rare.

Cœnonympha Pamphilus, L., April 30th; generally abundant.

Thecla ilicis, Es., May 28th; very common about sloe-bushes and settling on umbelliferous flowers. *T. rubi*, L., April 16th; common in bushy places on the cliffs and elsewhere.

Chrysophanus Thersamon, Es., June 26th; very common in waste places, and partial to umbels. *C. Gordius*, Es., May 28th; not unfrequent on the cliffs: a very shy insect, and difficult to obtain in fine condition. *C. Phlæas*, L., April 14th; abundant throughout the summer: most of the specimens very dark and suffused.

Polyommatus bæticus, L., June 9th; common in flowery places, and especially in a field of kidney-beans on the cliffs: a very sharp flier. *P. Telicanus*, Ht., June 27th; abundant, frequenting the flowers of *Lythrum salicaria*. *P. balcanica*, Fr., June 6th; common in dry, flowery places, and by the sides of paths, near Mal Tepé and elsewhere. *P. Tiresias*, Rg., July 5th; scarce and local, confined apparently to one little weedy spot on the cliffs, and invariably in bad condition. *P. Hylas*, W. V., April 18th (second brood, June 6th); common on the cliffs, in dry flowery spots. *P. Medon*, Hf., May 2nd; abundant throughout the summer. *P. Icarus*, Rg., May 2nd; extremely abundant everywhere. *P. Agestor*, G., May 30th; on the cliffs, scarce. *P. Admetus*, Es., June 26th; very common near Mal Tepé and on the cliffs, in grassy places among bushes. *P. Argiolus*, L., April 25th; common in bushy places all the summer. *P. semiargus*, Rg., May 2nd; a few specimens (all ♀) on the cliffs. *P. Cyllarus*, Rg., April 25th; common, and generally distributed, preferring rather damp places.

Pyrgus malvarum, L., June 6th; rare, on Mal Tepé. *P. marrubi*, R., April 16th; common throughout the summer by road-sides and in dry places. *P. lavateræ*, Es., May 16th; not rare in dry, flowery places. *P. sidæ*, Es., May 12th; this pretty skipper was not rare on the cliffs and near Mal Tepé, frequenting flowery, bushy places. *P. malvæ*, L., May 2nd; common in damp spots. *P. phlomidis*, H.-S., May 30th; rare, on the cliffs and in the ravine beyond Mal Tepé. *P. orbifer*, H., May 18th (second brood, July 7th); common, in dry flowery spots on the cliffs.

Nisoniades Tages, L., July 31st; rare. *N. Marloyi*, Bd., May 18th second brood. July 18th); not uncommon on the cliffs, and near Mal Tepé, in dry, stony places: conspicuous on the wing by its sooty blackness.

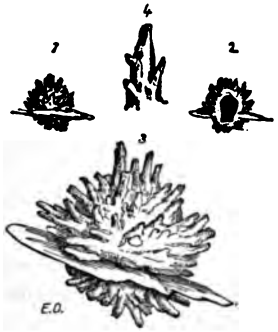
Pamphila Thaumas, Hg., May 26th; generally abundant. *P. Actæon*, Es., June 16th; very common in damp places on the cliffs. *P. sylvanus*, Es., July 14th; rare. *P. nostradamus*, Fab., June 27th; not rare in dry, hot places near the sea, but hard to catch, and almost always in poor condition: varying much in size, some of the ♀ being *one and a half* inch in extent of wings.

7, West Street, Blue Town, Sheerness:
27th November, 1878.

ON AN UNDETERMINED OAK-GALL.

BY ELEANOR A. ORMEROD.

The accompanying figure (1, natural size, 2, section, 3, magnified) is of a small gall, which I found last summer on a fragment of a leaf amongst a number of oak-sprays gathered in the neighbourhood of Isleworth.



The gall is about a quarter of an inch in diameter, irregularly spherical, about two-thirds of it above the upper surface of the leaf thickly beset with spines, for the most part simple, but in some cases branched (as at 4), the colour yellowish-green, with a mixture of rose, especially on the spines. Internally, the gall is single-chambered, with a hard, woody wall, about a quarter of the diameter of the gall in thickness.

On examination (when the time had passed for probable development of the gall-insect), the only tenant proved to be a whitish larva, dead, and too much distorted for complete identification, but from the presence of strong jaws, legs, and pro-legs, certainly not either dipterous or cynipideous. This larva, whether parasitic or otherwise (being the only fragment of a clue to the nature of the gall-maker), I have placed with the coloured drawing of the gall in the collection of British galls in Museum 2, at the Royal Gardens, Kew, and one portion of the bisected gall is in the hands of Dr. Friedrich Thomas, of Ohrdruf, Gotha (the well-known gall-observer) for reference. The gall was unknown both to him and the English gall-observers who have seen it.

Dr. G. Mayr, in his "Mitteleuropäischen Eichengallen," p. 33, and plate iv, fig. 44, gives a sketch of the gall of "*Cynips gemmea*," Gir., which, except in the spines of the *C. gemmea* being shorter than in the specimen figured above, bears much resemblance to it, but of these he merely says, "I refer, with regard to this doubtful kind, to the description in Dr. Giraud's 'Signalements,' and give only a drawing from a typical specimen in the Imperial Zoological Collection."

My great difficulty in any identification of this very well marked species arises from not noticing it at the time of gathering. I was *making a collection* of oak-galls, and put the sprays together in a box, and shortly after, in the course of repeated examinations, saw the torn leaf with this gall, which, consequently, I conjectured was not fully developed when gathered, and grew afterwards to maturity (as occurs with other of our leaf-galls, under favourable circumstances).

Should any of our gall-observers have noticed this species, it would be very interesting to have any information on the subject, which, I trust, will be my excuse for offering a note of what at present seems an imperfect observation.

Spring Grove, Isleworth :
December, 1878.

DESCRIPTION OF A NEW SPECIES OF *PLÆSIORRHINA (CETONIIDÆ)*, AND A NOTE ON AN APPARENTLY NEW SPECIES OF *CERATORRHINA*, BOTH FROM WEST AFRICA.

BY GEORGE LEWIS.

Plæsiorrhina Watkinsiana, *n. s.*

Oblonga, nitida, ærea ; thoracis marginibus, elytrorum fasciâ rectâ, corpore subtus, femoribusque obscuro-flavis. ♂ *et* ♀.

Hab. : *Isubu.* *Long.* 13 *lin.*

I have examined a series of this species, which is allied to *P. cincta*, but is rather longer, of more bronze-green (like *P. plana* in this respect), and differs especially in having the clypeus less clearly punctured, the thorax smoother, with its sides thickly punctured (punctures elongate), not densely strigose ; the scutellum is longer and smoother, the elytra also have smoother striæ, and are less strongly punctured about the shoulders. The fascia is very much narrower than in *P. cincta.*

I have named this species after Mr. W. Watkins, the well-known dealer, from whom my specimens were obtained.

I may also note that I have, from the same source, a series of a *Ceratorrhina*, closely allied to *C. aurata*, but more parallel, with more slender legs and tarsi, and the hind tarsi testaceous. I propose the name of *C. gemina* for it provisionally, feeling sure it will prove a distinct species, but at present I have not been able to examine any number of *C. aurata.*

Hab.: Mongo-ma-Lobah.

I have deposited types of both species in the British Museum.

3, *Green Street*, Grosvenor Square, W.:
10th January, 1879.

DESCRIPTIONS OF NEW SPECIES OF BRITISH ACULEATE *HYMENOPTERA.*

BY EDWARD SAUNDERS, F.L.S.

Pompilus consobrinus, Dbm., Hym. Eur., i, p. 79.

Closely allied to *gibbus* in size and general appearance, but easily distinguished from it by the long hairs on the metathorax; the head of this species is also much more densely covered with black hairs, and the 3rd submarginal cell is sub-quadrate, almost as in *P. spinus*.

♂ & ♀ taken by myself at Hayling Island in July; ♀ by J. B. Bridgman, Esq.

P. chalybeatus, Schdte., Kröyer's Nat. Tidskr., i, p. 338, No. 7.

Very closely allied to *gibbus*, but I think clearly distinct. The ♂ may be known at once by the 5th and 6th segments of the body, beneath, being longitudinally depressed, the 5th emarginate and the 6th deeply and somewhat squarely notched; the ♀ differs in having the clypeus very smooth and shining in front, its margin not raised at the sides, and with only two stiff setæ projecting from above the glabrous margin, whereas, in *gibbus*, the apical margin of the clypeus has somewhat large and irregularly scattered punctures, the sides are slightly raised and margined, and there is a series of several long setæ above the bright apical margin. The apical segment of the body is also much more densely covered with black hairs than in *gibbus*, and the 3rd sub-marginal cell is more triangular.

♂ & ♀, Chobham and Southwold. ♂, Worthing.

Mimesa equestris, Fab., *apud* Wesmael, *nec* Shuckard.

I have several specimens of a *Mimesa* with a red base to the body, which clearly belong to the species that Wesmael calls *equestris*, Fab. If his views of the synonymy be correct, and he seems to have considered them very carefully, our species that we have hitherto called *equestris* will have to be called in future *Shuckardi*. It may be separated at once by its narrow petiole, which has a carina down its middle (in *Shuckardi* the petiole is wide, flat and rugose); from *bicolor*, which it very closely resembles, it may be known by its shorter petiole, its more strongly punctured thorax, and strongly punctured mesopleuræ; in *bicolor* the puncturing of the mesopleuræ is almost unobservable.

I have taken this species at Southwold and Chobham.

Oxybelus mandibularis, Dbm., Hym. Eur., i, p. 514.

Closely allied to *uniglumis*, but with the mandibles flavous at the base and rufescent at the apex, the spots of the body of a more distinct yellow, and the puncturing of the 2nd and following segments much stronger and more scattered; thorax with the tubercles, and a spot on each side of the collar, flavous; the femora are black, with their apices pale, and the front pair is broadly flavous beneath; the tibiæ are flavous, more or less reddish at their extremities, the 1st and 2nd pairs with a streak behind, and the 3rd with a broad band near the apex, black; tarsi *rufescent*.

Mr. J. B. Bridgman first called my attention to this species, and sent me a specimen to examine; I found a similar one amongst my specimens of *uniglumis* taken at Littlehampton in July, 1873, and I have little doubt that they were referable to the above species.

HALICTUS PAUXILLUS, Schenck.

♀ in general appearance and size resembling *minutus*, but differing in the less closely punctured and shorter mesothorax, and the more definitely truncate metathorax, also in having the 1st segment of the body very shining and almost impunctate, such punctures as there are being so fine and scattered as to be scarcely observable; besides these characters there is a faint indication of a small white pubescent spot at the base of the 2nd segment, and all the segments are widely pale at the apex, the body is also of a slightly more regularly oval shape.

I have taken ♀s of this species at Chobham, and have others from Charlwood, Surrey. Dr. Capron has also taken it at Shere, near Guildford, and had himself separated it as a species new to him. I do not know the ♂.

H. LONGICEPS, *n. sp.*

Allied to *minutus*, but at once distinguishable by its long narrow face, which is considerably longer than wide, the mesothorax is also much more coarsely punctured, and the puncturing of the body is also coarser. The ♂ which I refer to this species has exactly the same shaped face as the ♀, and the puncturing of the thorax and body also corresponds; the head is thickly covered with grey hairs, and the clypeus is whitish at the apex; the antennæ, when the head is laid back, extend beyond the scutellum, and are fulvous beneath; the body is very closely punctured, the tarsi pale, more or less brownish towards the apex.

♀ not uncommon at the blossoms of the heath at Chobham, in June. I have specimens also from Wandsworth, Reigate, and Hastings. ♂ from Reigate and Southwold.

H. BREVICEPS, *n. sp.*

♀. Another of the *minutus* group, but very distinct from that species or *longiceps*. It has a shorter, rounder head than *minutus*, with a shorter, wider clypeus, the puncturing of the thorax is much coarser, the body and wings are shorter, and the nervures of the latter paler; the basal segment of the body is very smooth and ning at the base, punctured at the apex; the whole insect has a peculiarly thick pact form.

I have taken this species at Chobham and Hayling Island, but met with the ♂.

n. sp.

ss, and with the same shining surface to the thorax, but with the punctures very much larger, deeper and closer together, giving the thorax a somewhat rugose appearance; the whole insect is also somewhat larger. The ♂ differs from the ♂ of *villosulus* in having the puncturing of the thorax close and deep like the ♀, and the antennæ entirely black (not fulvous) beneath, as in that species.

In a lane near Guestling, Hastings, in October. I found the ♀ pretty commonly, but I only found one ♂. I have, however, another ♂, taken somewhere in the vicinity of Hastings.

Holmesdale, Upper Tooting:
January, 1879.

BRITISH *HEMIPTERA*—ADDITIONAL SPECIES.

BY J. W. DOUGLAS.

HETEROPTERA.

PERITRECHUS GRACILICORNIS.

Peritrechus gracilicornis, Puton, Pet. Nouv. Ent., ii, 117 (1877); Synops. Hém. Hét. de France, 85, 2 (1878).

Very like *P. geniculatus*, Hahn, in form, size, and colour. Differs in the antennæ being very slender throughout, the 2nd and 3rd joints cylindrical, not thickened upwards, and in all the tibiæ and tarsi being testaceous.

It resembles *P. nubilus*, Fall. (*cf.* E. M. M., xi, 267), in the slender antennæ, but they are finer than in that species, more especially with reference to the 3rd joint.

I have an example from Hastings, which I long since put aside as distinct, but forgot it entirely, until reminded of it by Dr. Puton's description of his new species, with which it agrees. Dr. Puton writes that it does not occur in the Departments of Vosges or Nord of France, but is found at Rouen, and that it is not unlikely to inhabit the South of England.

Lygæus puncticeps, Thoms. (*cf.* E. M. M., xi, 267), is now recognised as *Pachymerus geniculatus*, Hahn (Wanz., i, 68, t. x, fig. 41 [1831]), and this having priority, the specific name will have to be adopted, *vice puncticeps*. Herrich-Schäffer led the way into error in the index to the "Wanzenartigen Insecten," by putting *geniculatus*, Hahn, = *nubilus*, Fall., and so it passed, until Thomson, finding there were two allied species, referred one to *nubilus*, Fall., and named the other *puncticeps*, not knowing or not recognising that it was Hahn's *geniculatus*. *Peritrechus nubilus*, Vollenhoven (Hem.-Het. Neerlandica, *p. 46, pl. 6, fig. 6* [1878]), must be referred to P. geniculatus.

Of *P. nubilus*, Fall. (*vide l. c. supra*), Dr. Puton says (*in litt.*), the distinct maculation of the membrane of the elytra, in comparison with the obscure marking in *P. geniculatus* and *P. gracilicornis*, is one of the characters of the species always particularly noticeable.

HOMOPTERA.

DICRANONEURA AUREOLA.

Cicada aureola, Fall., Act. Holm., 25 (1806), Hem. Suec., ii, 39, 22 (1829).

Iassus aureolus, Germ., F. Ins. Eur., 17, 20.

Typhlocbya aureola, H.-Schf., F. G., 164, 16; Flor, Rhyn. Livl., ii, 391, 6 (1861); Kirschb., Cicad., 182, 11 (1868).

Erythria aureola, J. Sahlb., Not. Fenn., xii, 202, i, pl. ii, fig. 24 (1871).

Notus aureolus, Leth., Hém. Nord., 78, 7 (1874).

Typhlocyba chlorophana, H.-Schf., F. G., 124, 9.

Broad, upper surface pale greenish-yellow.

Head transverse, longest in the middle, rounded in front, scarcely angulate, including the long, not projecting, eyes lunate, wider than the pronotum. *Eyes* concolorous with the head, but partly with a darker shade. *Pronotum* convex, in front following the contour of the concave posterior margin of the head, posteriorly deeply emarginate; posterior angles obliquely truncate, disc in the middle slightly infuscated. *Scutellum* large, posteriorly distinctly acuminate. *Elytra* broad' posteriorly broadly rounded; membrane sub-hyaline, slightly infuscated; nerves straight, parallel, yellow, the second cell shorter than the others. *Wings* slightly infuscated, sub-hyaline; nerves strong, blackish, except at the base of the apical furcation of the third, which is pale, as also is the transverse nervule connecting the fork with the second nerve; the said furcation at its commencement acutely angulate, and then divergent to the intramarginal nerve. *Legs* yellow; posterior tibiæ outwardly with small black dots at the base of the dark spines; claws of the tarsi blackish. *Abdomen* above, black, the posterior margin of the segments, including the genitalia, broadly yellow, under-side yellow. Length, 1¼ line.

Found among heather (*Calluna vulgaris*), in August and September. The species, new to our fauna, was taken last autumn at Forres, by Mr. G. Norman.

In the Verh. z.-b. Ges. Wien, xvi, 507, Fieber founded on this species his genus *Erythria*, but the slight differences in the form of the head and the neuration of the wings from his genus *Notus* (= *Dicranoneura*, Hardy), doubtless induced him subsequently (Kat. Cicad., p. 14) to merge it in the latter.

8, Beaufort Gardens, Lewisham, S.E.:
10th December, 1878.

Dyschirius angustatus in Yorkshire.—Last summer, at Bridlington, Yorkshire, I took four specimens of a *Dyschirius* which I did not know, but which Mr. Champion has determined to be *angustatus (jejunus,* Dawson). In company with it I took two or three specimens of *Bledius erraticus.* It is perhaps worthy of remark, that these two beetles were originally found together in the same place (Lanercost, near Newcastle), almost the only locality hitherto recorded in Britain for either.—W. W. Fowler, Repton, Burton-on-Trent: *January,* 1879.

Occurrence in Britain of Harpalus (Scybalicus) oblongiusculus, Dej.—I have recently detected a ♀ example of this well-marked species amongst a large number of *Harpalidæ* (including *H. sabulicola, rotundicollis, rupicola, puncticollis, neglectus, rubripes, serripes, vernalis,* &c.) captured by my friend Mr. J. T. Harris on the Chesil Bank, Weymouth, in May last. *H. oblongiusculus* (apart from its larger size and the somewhat different structure of its male anterior tarsi) may be at once known from *rupicola, cordatus, puncticollis,* and others of the *Ophonus* section, superficially resembling it, by the shape of the thorax, which is much constricted behind, with the posterior angles very obtuse and almost rounded and the base nearly straight, the very pubescent elytra, &c. This example agrees very well with Dejean's description (Dej. Spec., iv, 198), and also with continental examples of *H. oblongiusculus* in the British Museum and my own collection, except that it is rather smaller in size; the species is tolerably common in the neighbourhood of Paris, Lyons, and other parts of France, and there appears no reason why it should not extend to this country, the locality already producing one or two peculiar species, as *Omophlus armeriæ, Harpalus vernalis,* &c.—G. C. Champion, 274, Walworth Road, London: *January 8th,* 1879.

Notes on the Coleoptera of Chobham.—Mr. Edward Saunders (*vide* vol. xiii, p. 113 *ante*) gives a list of *Coleoptera* occurring at Chobham, and remarks that there are few localities better worth visiting to those interested in the *Hymenoptera* and *Hemiptera.* During the past three years, I have occasionally visited the locality—thanks to the kindness of Mr. Saunders, who originally guided me to the spot—and I think the above remark will certainly apply equally well to the *Coleoptera,* the neighbourhood of Chobham having produced to me some of our rarest sand-loving *Geodephaga.* I have visited the locality at various times of the year, but more especially during early spring and late autumn, the latter I find by far the best for the *Geodophaga.* Avoiding, as much as possible, the species recorded by Mr. Saunders, I note the following:—*Anchomenus gracilis,* common in wet *Sphagnum*; *Anisodactylus binotatus,* var. *atricornis,* sparingly in damp places on the heath, but never in company with the type; *Harpalus discoideus* (both sexes), rarely, under stones and at roots of heath, late autumn; *Amara infima,* not uncommon under stones, &c., on bare places on the heath—a species long sought after by me; *A. patricia,* rarely, sand-pits; *Bembidium nigricorne,* rare, sandy places, certainly distinct from *B. lampros* or its var. *velox,* and easily separated from that common species by its shorter and more convex form, entirely black legs and antennæ, &c.; *Acupalpus brunnipes,* rather common in wet places on the heath, apparently always on peat as at Esher; *Parnus striatellus,* Fairm., one or two in wet places; *Myllæna* Kraatzi, Gymnusa *brevicollis,* and *Philonthus signaticornis,* and *nigrita* (common), in wet Sphagnum;

Stenus Kiesenwetteri, several, in wet *Sphagnum*, early spring, in a very similar locality to that at Wimbledon, and most of the usual Wimbledon species occurring with it; *S. opticus* and *cinerascens*, wet places; *Aphodius tessulatus* and *testudinarius*, *in stercore*; *Smicronyx cicur*, on the heath.—ID.: *December 2nd*, 1878.

On the habits of Apion Hookeri and Thyamis dorsalis.—Apion Hookeri: there is a small field at Knowle, Warwickshire, in which I have occasionally found single specimens of this species by sweeping, and in which, this year, I took a goodly number by an accidental discovery of its favourite plant. In looking for larvæ of *Cucullia chamomillæ* on the wild chamomile (*Matricaria chamomilla*), I noticed a small black speck upon each of several unopened buds, which, upon closer examination, turned out to be our little friend *A. Hookeri*. Every specimen was deeply absorbed in the business of feeding, having its tiny head buried in the centre of the unopened bud. I did not find a single one on an open flower. As I have never seen this fact previously recorded, I thought it might be worth communicating.

Thyamis dorsalis: during a spring visit to Ventnor this year, I searched for *T. dorsalis* in every conceivable spot, without finding more than two specimens. I determined to procure more if possible, and so set about my task systematically. I shook individual plants into my net, without result, until I became tired. At last, seeing a tuft of common groundsel (*Senecio vulgaris*), I made a stroke at it as a sort of final effort. To my great joy, *T. dorsalis* was discovered at last! Seven individuals fell from that small tuft of groundsel. I tried again in another place, and more *dorsalis*. Seeing a field in which *Senecio* was growing in abundance, I went and swept it, meeting with the most complete success. I afterwards took a friend with me to the same spot, and he bagged *dorsalis* to his heart's content.—W. G. BLATCH, Green Lane, Smallheath, near Birmingham: *December 18th*, 1878.

[The attachment of these two beetles to the plants respectively specified is familiar to all southern collectors.—EDS.]

On the habitat of Enœcyla pusilla.—This autumn, when sweeping the moist herbage under the trees in Monk's Wood and Crown East Wood, I obtained males of this caddice-fly,—thus bringing its habitat in this country and on the continent into harmony. The situations where I had previously taken the species—near the margins of rivulets—are not really out of agreement with its woodland habitat. The whole district where it occurs was once wooded; and, no doubt, when the country was brought into cultivation, some remnants of the trees and undergrowth would be left by these tiny watercourses, affording the needful conditions (moist moss to feed on, and a situation to hide in, after the feeding time is past, alike free from wet and drought) for the insect's life-course. By two of these rivulets there still exist evident relics of the ancient forest—for instance, at Mudwall, where the rivulet runs by the high road, there is a rather steep bank, of a few yards in extent, clothed with our regular woodland flora, including one or two scrubby oaks; and at this place, which does duty for a field hedge, I recently took a specimen of *Leucophasia sinapis*.—J. E. FLETCHER, Happy Land, Worcester: *November 30th*, 1878.

On the preservation of Aphides, &c.—Perhaps it may be of interest for you to hear that the method of preserving *Aphides* communicated by M. J. Lichtenstein *in Ent. Mo. Mag., xv, 191*, has been detailed previously by Mr. F. Petzold, of Vienna, *in No. 8 of my Entomologische* Nachrichten (1878). Mr. Petzold's method has the advantage of using a ring of thick card, which you mention in your note. The specimens I saw are very well preserved, though several years old.—F. KATTER, Putbus: *January* 10*th*, 1879.

Lepidoptera of Yorkshire.—At a meeting of the Entomological section of the Yorkshire Naturalists' Union, held at Leeds, on January 11th, it was decided to publish a list with localities of the *Lepidoptera* of the county of Yorkshire. Its compilation was placed in the hands of Mr. W. Prest, of York, and myself. May I ask, therefore, that every Lepidopterist who has collected in any part of Yorkshire will kindly send list with localities (and, in the case of rare species, *dates*) of all the species noticed, with any notes that may be of use, to me, as early as convenient. I need scarcely say that all such assistance shall be fully acknowledged.—GEO. T. PORRITT, Highroyd House, Huddersfield: *January*, 1879.

On the power of resisting intense cold possessed by Cheimatobia brumata.—At the meeting of the Entomological Society of London, held on the 4th January, 1875 (*vide* Ent. Mo. Mag., xi, p. 213), I called attention to the appearance of quantities of this moth immediately after the breaking up of a severe frost, and asked if they were recently emerged or not, a point upon which there appeared to be difference of opinion. The question has again occurred to me. Last night witnessed a sudden thaw after three weeks of nearly continuous frost, latterly of great severity, inasmuch as the thermometer registered only 5° Fahrt. (= —15° Centigrade) on the night of the 24th inst. To-night, *C. brumata* is flying to the light as lively as if nothing had occurred. The earth is still frozen, excepting on the surface, so I think it impossible that the moths can have only just emerged from the pupæ, and it follows that they must have existed in the perfect state through the frost; it would hardly be proper to say "lived," for they could not have been otherwise than frozen. It would be an interesting experiment to test the greatest amount of cold this little moth can bear without losing its power of re-vivifying.—R. MCLACHLAN, Lewisham: 26*th December*, 1878.

The autumnal pupation of Abraxas grossulariata.—In connection with the note of Mr. Silcock on this subject (p. 150 *ante*), I may record, that in October last, seeing some currant and gooseberry bushes were being defoliated, I beat out of them a great many larvæ of *A. grossulariata*, and was surprised at the great size to which many of these had attained, the others being of the small dimensions usual at that season. To-day, I disturbed one of the larvæ which had escaped my raid, from its retreat under a loose piece of the bark of an apple tree overhanging a currant bush; it was more than half-an-inch in length, and, although there is hard frost, it was lively, and swung itself down by a silken thread. Close by, under the shelter of a horizontal branch, there are several pupæ alive, suspended in their ordinary slight hammocks.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 5*th January*, 1879.

Variety of the larvæ of Abraxas grossulariata.—Mr. Porritt, making his statement respecting these larvæ at second hand, has fallen into one or two slight errors that are better corrected at once. First, the larvæ do not occur here, but in

Northumberland, a few miles north of Newcastle-on-Tyne. Second, they are not all sooty-black, but vary in every degree, from the ordinary colour of the larva to uniformly black, even more so than the specimen Mr. Porritt describes. I was rather late in getting them last year, and most of them got into pupa before I could get them sent off. I will endeavour to get a good supply this year, and will be happy to supply any entomologist desiring either to preserve or rear them. I have bred a great many of them, but never got a variety, and the dark specimens are so different from the type, that it scarcely seems as if they came out right, when they produce only the ordinary form of the imago. I do not wonder that Mr. Porritt had no idea what the larvæ were.—John E. Robson, Bellerby Terrace, West Hartlepool: *January*, 1879.

Natural History of Crambus geniculeus.—On September 4th, 1877, my friend, Mr. Wm. R. Jeffrey, kindly sent me a female moth of this species alive in a pill-box, wherein she had laid a few eggs loose, and continued to lay a few more until the 9th, when she died.

The eggs began to hatch on the 28th of the month, one or two at a time, until the end of October, and, as the young larvæ hatched, they were in succession placed on a potted turf of short grass cut from a dry pasture, and I had no further trouble with them through the winter beyond occasionally watering the grass, which continued to look very well up to the commencement of March, 1878, when it began to look sickly and to die off: meanwhile a fresh turf was potted just in time to receive the remaining larvæ, for many had already left their winter quarters in quest of fresh pasture, and I picked up a few while making their escape from the withered turf; amongst which, however, quite enough still remained, crawling actively amongst the threads spun in connection with their silken galleries, now for the most part abandoned; these galleries were close to the earth, and some few partly beneath the surface, crowded with frass at the bottom and made of dirty-brown silk, they were not conspicuous.

By April 13th, the fresh turf had become greatly ravaged and the larvæ were rapidly maturing, two at this early period having already spun up; and a further examination at the end of the month proved them to be full-fed and all spun up, after converting their galleries into cocoons, wherein they remained (while the grass flourished) for the three following months. The moths appeared at intervals, two or three at a time, from the 2nd to 25th of August.

The egg of *geniculeus* is roundish-ovate in shape, the shell rather strongly ribbed and reticulated, and slightly glistening; its colour, when first laid, is yellowish-white, but changes in a few days to salmon colour, afterwards to pinkish-red, and a few hours before hatching again changes to a dark pinkish-grey.

The newly-hatched larva is of a rose-pink colour, with a blackish head and a brown plate on the second segment; and when about the age of five months it is half an inch long, of a very dingy reddish-brown or greyish-brown colour, with blackish head, black plates and spots, altogether darker than it afterwards becomes.

The full grown larva measures five-eighths of an inch in length and is moderately stout in proportion, cylindrical, though tapering a little at the hind segments, the head, full and rounded, is a trifle less than the second segment, which is rather long, each segment after the fourth has a deepish wrinkle across the back. The colour of the head is shining black with reddish-grey margins to the lobes on the face, a transverse streak of grey just above the mouth, and the papillæ paler grey; the ground colour of the body is reddish-grey or light brownish-grey, darkest on the thoracic segments, paler behind where it is slightly tinged with ochreous, and palest on the belly; on the second segment is a broad semi-lunar black shining plate dorsally divided by a line of grey, a dark dorsal line is visible through the dull skin, which is greatly relieved by the glossy tubercular spots of dark brown, these on the hinder segments are of warmer brown and also the anal plate; of the trapezoidal spots on the back the front pairs are the largest, of a rounded-off squarish shape, the hind pairs smaller and transversely oblong, and in front of the anal plate the two spots are united together; along the side is a longitudinal row of spots, two on a segment, the front one roundish and less dark, the hind one transversely oblong and much paler; the spiracles are very small, round and black, situated on the pale tracheal thread which shows faintly through the skin, beneath these occur other tubercular longitudinally-ovate shining spots, every spot furnished with a fine hair.

On opening a cocoon—which is of an earthy-brown colour, nearly half an inch long, and roundish-oval form—the pupa was found quite lively within it on the 26th August; it was of moderate slenderness, a trifle over three-eighths of an inch in length, the head obtusely pointed downward in front, the thorax convex, the eye, leg, and wing-covers very distinct, and also the antennæ, which take a sweeping curve round the eye to the end of the wing; the abdomen tapering to its rather blunt extremity, the free abdominal segments deeply cut; in colour, light brownish-ochreous, much freckled with darkish brown on head, thorax, and wings, these last being rayed and margined with still darker brown, the eyes and anal segment equally dark brown, the whole surface shining.—WILLIAM BUCKLER, Emsworth: *December 2nd*, 1878.

Note on Gelechia nanella, Hübn.—In Stainton's Manual (ii, p. 342), we read,—"Larva in the flowers of pears." This statement, I know, was founded on actual observation, but it is only a little bit of the natural history of the species, and not the beginning of it, for the egg could not have been laid in the flowers nor could the larva have continued to feed there, seeing how short a time the flowers last, and where it went afterwards we are not told. I am not in a position to say either; but I can add a little to the ultimate stage of the history. I sought in vain on the trunks of the pear trees for the imago, but last July, on an apple tree, five feet from the ground, I saw a dozen or more sitting close to empty pupa-skins sticking out of crevices in the bark, from which, doubtless, they had but just emerged. I infer that, after the manner of those of their race with the pear-flowers, the larvæ of these had fed on the apple-blooms, and that, after feeding up in the young fruit or leaves, they had secreted themselves in the crevices of the bark of the tree, and there changed to pupæ. Perhaps some one has watched the manners of the species throughout its life and can give us the history.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *December 10th*, 1878.

On a new Swammerdamia, hitherto confounded with cæsiella.—Mr. Barrett sent me, last September, a series of what he reputed two distinct species of Swammerdamia, *hitherto confused by us as cæsiella.* I was able, in reply, to inform him that Professor Zeller had written a little treatise on this group in the Stettin. ent. Zeitung for 1871, and had differentiated the two species exactly as Mr. Barrett had done. The name *cæsiella* should now be dropped and not retained for either species—one, feeding on hawthorn, being the *oxyacanthella* of Duponchel and Zeller; the other, feeding on sloe, being the *spiniella* of Hübner and Zeller.

Of *Swammerdamia oxyacanthella*, Mr. Barrett writes: "The larva is dark red-"brown, with a broad spiracular stripe, which is yellow from the head to near the "middle and thence reddish to the extremity, *no dorsal line*, lives in a white web "singly, in an angle of the twigs of hawthorn. Beginning of June. Imago first "emerged June 26th, all others being then in the pupa state."

Of *Swammerdamia spiniella* he writes: "The larva reddish-brown, *with a broad "ill-defined pale dorsal line*, and a broad *yellowish-white* spiracular stripe. The "dorsal line in full grown larvæ is not always continued to the anal extremity, but "is always very distinct towards the head and anterior segments. On black-"thorn, in a similar loose web to the other, but often two or three larvæ in one web. "Middle of June to end. Imago emerged July 7th."

Mr. Barrett adds "these distinctions were perfectly constant. I had a fair "number of the hawthorn larvæ, and found those of the other species in great "abundance on blackthorn. These latter were still feeding when the hawthorn "species was in pupa and emerging." He says also, that he "took the hawthorn "species in great abundance at Llanberis—only among hawthorn." *Spiniella* "was "afterwards plentiful everywhere amongst blackthorn."

In the eleventh volume of the Natural History of the Tineina, I have confused these two species as the *sexes* of my *S. cæsiella*—see p. 70—"Thorax white in the "male, grey in the female." *Spiniella* has the thorax white, *oxyacanthella* has it grey.

Zeller, in the Stettin. Ent. Zeitung, 1871, p. 75, points out the differences of the two larvæ, laying stress on the identical characters mentioned by Mr. Barrett.

Everything would therefore seem perfectly clear and distinct, only, unfortunately, I have on several occasions bred what appears to me to be *spiniella* from a *hawthorn* hedge, in which there is not an atom of sloe. The problem now will be to try and find the two larvæ on this same hedge and to separate them and breed the two distinct species.—H. T. Stainton, Mountsfield, Lewisham: 12*th December*, 1878.

Occurrence of Swammerdamia nanivora in Russia.—During a recent visit of Baron von Nolcken to this country I was much pleased to see in one of his boxes three specimens of *S. nanivora*, of which I had previously only seen the single specimen, which I bred, in 1870, from a larva found, in Strathglass, by Dr. Buchanan White, on *Betula nana*, and which was briefly noticed in the Entomologists' Annual, 1871, p. 96. Baron von Nolcken captured his specimens, on June 8th, 1878, in Esthonia, in a mossy bog, among *Betula nana*. The size and distinctness of the sub-apical costal spot was well seen in the Baron's specimens, and Mr. Ragonot, who had an opportunity of seeing them during von Nolcken's stay in Paris, also noticed this character. It will be remembered, however, that the species was established mainly on the *brown* larva being so different from the *green* larva of the ordinary birch feeder, our *griseocapitella*, the *Heroldella* of German authors.—Id.: *January*, 1879.

Depressaria atomella, a new species to Britain.—This species now appears on the scene as if it was only bred last year: whereas, I actually sent specimens to Mr. Stainton in 1861, as it puzzled me. He returned it as *atomella* (the broom-feeder *scopariella* had not then been separated specifically, and both were then mixed under the one name *atomella*), with the remark, that probably the food-plant, *Genista tinctoria*, was the cause of some variation from the usual appearance of the insect. I bred several dozens, and all my correspondents will have it in their cabinets: it may readily be distinguished from the others by the pinkish tinge on the anterior wings, as also by their being much longer than in *D. scopariella*.

Three years ago, I sent specimens to Mr. Barrett, he said, "Are you sure it is *atomella*?" I replied that it was so named by Mr. Stainton. I heard no more about it until September 30th, 1878, when I received a letter from Mr. Barrett, saying, "I am doing my utmost to prove that *your D. atomella* from *Genista tinctoria* is distinct from the species taken in the south of England and hitherto called *atomella*, but do not be too sanguine; the *Genista-atomella* is much more local than the other. I may add, that I have bred a lot here."

The readers of the January number of the Magazine would imagine that my valued friend Mr. Barrett was the discoverer of the species, whereas, I have been breeding it for the last seventeen years, and I have no doubt that Mr. Stainton's "single specimen of unknown origin" was from me.—J. B. HODGKINSON, 15, Spring Bank, Preston: *Jan. 4th*, 1879.

Elachista monticolella.—In August, 1872, I took several of this insect at Witherslack. I thought at the time I could see a difference from *kilmunella*. I sent all my fine series of the latter and several of the former to Mr. Stainton to examine. He replied, "Get more and try and breed it, you may get a new species." I placed them in my cabinet as *E. festucella, n. sp.* Last July I called Mr. Sang's attention to them, he did not know the insect, and remarked that he had some *Elachista* larvæ then feeding, which he did not know. Oddly enough, they came out *E. monticolella*. I sent the same specimens again to Mr. Stainton to overhaul, and this time he returned them as *monticolella*, with a note saying they are probably Edleston's *alpinella*.—ID.

Note on the synonymy of Cicada montana, Scop.—In the "Ann. Soc. Ent. France," 2^{e} Ser., v, 154—156 (1847), Amyot, in pursuance of his "Système mononymique," changed the names, among others, of four species of *Cicadina* into *Tibicina* (derived from the genus *Tibicen*, Latr.), *Melampsalta*, *Tettigetta* and *Cicadetta*, the latter being in place of *hæmatodes*, Fab., = *montana*, Scop., our English species. The conversion of specific into generic names, although common with zoologists and botanists, has often been reprehended and would have been specially denounced by Amyot in his case. In his "Meletemata Entomologica," vii, 414—425 (1857), Kolenati restored the specific names which Amyot had set aside, and adopted Amyot's names as sub-generic under the genus *Cicada*, Auct. In his "Hemiptera Africana," iv, 25 (1866), Stål preserved *Tibicen*, Latr., as a distinct genus, but made the other three sub-genera into a genus (p. 42), enlarging the characters thereof accordingly, as he had a perfect right to do; yet it was not correct to call the genus, as he did, *Melampsalta*, Kol., for it is not only not Kolenati's sub-genus, but is composed of elements which had been by him purposely separated from it under other names. J. Sahlberg, in the "Notiser Fl. et Faun. Fenn.," xiii, 77 (1874), does not allude to Stål, yet places *montana*, Scop., in a genus which he calls *Melampsalta*, Kol., although Kolenati made the species, as above stated, the type of his sub-genus *Cicadetta*. It has, I know, been held to be obligatory that when genera are amalgamated the name of one of them should be attached to the new combination, but, without admitting this, then at least the genus should have the author's name appended. The true way would be to give a new generic appellation, for the addition to the nomenclature thus created would be a less evil than is the appropriation of a name to things for which it was not intended. Fieber, in his posthumous work, edited by Dr. Puton, "Les Cicadines d' Europe" (1875), gives *Tibicina*, Amyot, Kol., as a distinct genus, but does not advert to *Tibicen*, Latr. and Stål, except in the synonymy of some of the species, ignores Stål and Sahlberg as to the adoption of the genus *Melampsalta*, and uses *Cicadetta* as the name for a genus of 26 species, giving it as equivalent to *Cicadetta*, Kol., and *Melampsalta*, Kol. in part, yet attributing it, as a *genus*, to Amyot. The question for us now is—what generic name is to be adopted for our one British species, viz.: *Cicadetta*, Kol. (= *Cicadetta*, a species, Amyot), *nec* Fieb.; or *Melampsalta*, Stål and J. Sahlb., *nec* Kol.; or *Cicadetta*, Fieb., *nec* Kol.; or a new name. I should vote for Stål's comprehensive genus if it were not for the objection to the false application of the name of Kolenati as its author, and to the wrong principle of using the generic name otherwise than for such species as would be covered by the characters given for the sub-genus by the original author.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *December 1st*, 1878.

Review.

A CATALOGUE OF THE BRITISH TENTHREDINIDÆ, by P. CAMERON. Published by the Natural History Society of Glasgow. 8vo, 1878.

Although this does not pretend to be much more than a label list, it is a valuable contribution to the literature of British Insects, there having been no attempt made to give a complete view of the British saw-fly Fauna since the time of Stephens' "Illustrations." The principal synonyms are added. Mr. Cameron admits 324 British species, and of these 76, or nearly one-fourth, belong to the unmanageable and difficult genus *Nematus*. The arrangement is very different to that followed by most of the former writers on the group, and no doubt Mr. Cameron will duly explain the reasons for his system in the Monograph he has in preparation.

Obituary.

Adam White died at Glasgow on the 4th January, aged 62. He was born in Edinburgh on the 29th April, 1817, and was educated at the High School of that city. When quite a lad he came to London with (we believe) no other credentials than a letter of introduction to Dr. Gray of the British Museum, and a strong determination to establish himself in the metropolis in a position suitable to his tastes. He became an official in the Zoological Department of the British Museum in December, 1835, and continued a faithful servant of that institution up to 1863, when mental indisposition necessitated his retirement, on a pension. During this time he published many and varied papers on almost all branches of Entomology, and also a few on Botanical subjects (with some separate works, chiefly of a semi-popular nature). His last scientific communication, before his illness had become established, was to the meeting of the Entomological Society on November 4th, 1861. Tested in time's crucible, his work has proved to be of far more than ordinary value, and the opinion of those best able to judge on special points, tends to show that, excepting in a few instances in which he worked "to order," he displayed an amount of ability rarely excelled by writers of his time. After a period of confinement, he so far recovered as to be able to add to his pension by literary work, and we find also that two short papers by him appeared in the Proceedings of the Royal Physical Society of Edinburgh, written in 1865 and 1866. But he suffered several relapses; yet even when an inmate of one of the Scottish Asylums, he edited, and largely contributed to, a Journal, the contents of which were supplied by patients. By many entomologists of the present generation he was no doubt thought to have long passed from among us. Now that he *is* dead, it is only just that a small tribute be paid to his memory. Those who, during his time of office, had occasion to consult the entomological collection of the British Museum, will bear testimony to the assertion that no one was more willing to go out of his way to oblige, and the writer of this notice cannot express how much he profited, as a *débutant*, by his invariably wise counsel and ready assistance. Mr. White was a Member of the Entomological Society of London from 1839 to 1863, and a Fellow of the Linnean Society from 1846 to 1855.—R. McL.

ENTOMOLOGICAL SOCIETY OF LONDON.—*4th December*, 1878. H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

Mr. T. P. Newman, of 7, York Grove, Peckham, was elected a Member, and Mr. J. J. Walker, of Sheerness, a Subscriber.

Mr. Stainton exhibited a series of *Glyphipteryx schœnicolella*, of which many examples had been taken last summer, near Witherslack, by Mr. Threlfall.

Mr. Wood-Mason remarked on the method of stridulation used by one of the *Rutelidæ*.

Professor Westwood exhibited varieties of *Epinephile Tithonus* and *Jurtina* (*Janira*), the latter being especially interesting, owing to the left hind-wing having, on the under-side, a streak of the paler colour usual in the ♀, the insect being otherwise ♂. He also exhibited various enlarged coloured diagrams of varieties or monstrosities, including a ♂ *Perrhybris Pyrrha* (in the late Mr. Hewitson's collection) having the under-side of the right hind-wing coloured as in the ♀, which sex mimics a species of *Heliconia*; also diagrams of two already recorded instances of perfect insects with larval heads, viz., *Nymphalis populi* and *Dytiscus marginalis*.

Mr. McLachlan exhibited a series of cases of Brazilian caddis-flies forwarded to him by Dr. Fritz Müller; they included those of several forms of *Hydroptilidæ*, a *Setodes* (or ally), and others of uncertain position (in the absence of the perfect insect). One of these latter was composed of pieces of leaves, and was found in the water that collects between the leaves of *Bromeliæ*, in which situation Dr. Müller had also found tadpoles, and also larvæ of dragon-flies and other aquatic insects. Mr. Bates had informed him that rain water collects at the bases of the leaves of these plants, and remains there for nine months in the year. Dr. Müller also sent a photograph of some peculiar cases referred by him to the *Hydropsychidæ*, having a funnel-shaped network entrance. Dr. Müller likewise sent drawings of the neuration of various genera of *Lepidoptera*, in order to show the homology that existed, in this respect, between these insects and the *Trichoptera*. Mr. McLachlan called especial attention to the homology between the neuration of *Castnia Ardalus* as delineated by Dr. Müller and that of *Hydropsyche*, which possessed the most complete arrangement of nervures amongst the *Trichoptera*; and Mr. Stainton alluded to the Trichopterous nature of the neuration, and other points of structure, in *Micropteryx*. Professor Westwood was not yet convinced of the existence of these homologies, and suggested that coloured diagrams of the supposed homologising arrangement should be supplied.

The Rev. A. E. Eaton exhibited a piece of "Kungu Cake," used as food by the natives of the district of Lake Nyassa, as recorded by African travellers. It is made of the accumulations of vast quantities of small insects that collect on the shores of the Lake, and which had been supposed to be *Ephemeridæ*. The substance is black, amorphous, and tasteless; and, in the piece placed in his hands, he had been unable to detect remains of *Ephemeridæ*, but had discovered the wings of minute *Culicidæ*.

The Secretary read the Report of the sub-Committee appointed to examine into the question of the destruction of grain at Taganrog by *Anisoplia austriaca*, in which special allusion was made to the enormous swarms of the insect that occurred in the province of Banate in 1867, as recorded by Pastor Orth and Herr von Pelikan in the Verhand. zool.-bot. Gesellschaft in Wien for that year. It was estimated that 6,720,000 of the beetles were destroyed at the time, 100 men having been employed for that purpose. In the report it was suggested that rotation of crops and the preservation of insectivorous birds should be attended to; and that the only occasional appearance of the insect in extraordinary numbers may be due to the simultaneous development of perfect beetles that might have remained, and accumulated, in the pupal stage, for a series of years.

With regard to the subject of insects used as food, Mr. Distant said he had been informed that *Euthesia fullo*, a common eastern Hemipterous insect, was largely eaten by the natives of the Naga Hills. Mr. Meldola called attention to the chemical composition of the bodies of insects, and showed that analysis proved them to contain nitrogen, and Mr. W. Cole had also detected phosphoric acid.

Mr. C. O. Waterhouse sent for exhibition a living specimen of an undetermined species of *Calandridæ*, found in an orchid house at Windsor.

Mr. A. G. Butler communicated a paper on a collection of *Lepidoptera* from Cahar, N. E. India.

15*th January*, 1879. H. W. Bates, Esq., F.L.S., &c., in the Chair. *Anniversary Meeting*.

The following were elected Members of the Council for 1879, viz.: H. W. Bates, F.L.S., W. L. Distant, J. W. Dunning, M.A., F.L.S., Rev. A. E. Eaton, M.A., E. A. Fitch, F. Grut, F.L.S., Sir J. Lubbock, Bart., M.P., V.P.R.S., &c., R. Meldola, F.C.S., E. Saunders, F.L.S., F. Smith, S. Stevens, F.L.S., J. J. Weir, F.L.S., and Professor J. Wood-Mason, F.G.S.

Subsequently the following Officers were elected, viz.: Sir J. Lubbock, President; J. J. Weir, Treasurer; F. Grut, Librarian; R. Meldola and W. L. Distant, Secretaries.

The retiring President read an Address, which was ordered to be printed; and *the Meeting* terminated with the usual votes of thanks to him, and to the other *Officers of the Society*.

LIST OF THE *HEMIPTERA* OF NEW ZEALAND.

BY F. BUCHANAN WHITE, M.D., F.L.S.

(*Concluded from page* 161).

HOMOPTERA.

Div. CICADARIA.

In his list of New Zealand insects, Prof. Hutton enumerates 21 species of *Homoptera*, viz., 12 species of *Cicada*, 7 of *Cixius*, and 2 of *Ptyelus*. To these fall to be added 2 species recorded elsewhere, making in all 23 supposed species. Four of the names, however, are merely synonyms, which reduces the list to 19. In the following list I am able to add 8, making a total of 27 New Zealand *Cicadaria*. This is just half the number of *Heteroptera*, which is, curiously enough, the same proportion that the British *Cicadaria* bear to the British *Heteroptera*. In New Zealand, however, there must be many additional species of both sub-orders yet to be discovered.

Fam. CICADIDÆ.

Twelve *Cicadæ* have been recorded, but Stål has shown that 4 of these are identical with others. All belong to the genus *Melampsalta*, Kol., Stål, and 5 of them were described by the late Mr. Walker. I have before me 8 or 9 New Zealand species of *Melampsalta*, but, with one or two exceptions, I cannot identify any of them from Walker's descriptions, though I have no doubt they include many of his species. Though of opinion that species which are so described that they cannot be identified without an examination of the types, ought not to stand, I am unwilling to add to the synonymy by giving new names to the species before me, and will, therefore, in the meantime, merely quote the Walkerian (and other) species with their synonyms as pointed out by Stål.

55. *Melampsalta cingulata* (= *Tettigonia cingulata*, F., *Cicada flexicosta*, Stål, *C. zealandica*, Boisd., *C. indivulsa*, Wlk.).

Mr. Wakefield. Found also in Australia.

56. *M. scutellaris* (= *Cicada scutellaris*, Wlk., *C. sericea*, Wlk.).

57. *M. muta* (= *Tettigonia muta*, F., *Cicada Cutora*, Wlk., *C. ochrina*, Wlk.).

A series of specimens from Messrs. Hutton and Wakefield seem *to belong to this species.*

55. *M. Tristigma* = *Cicada Tristigma*, Wlk., *C. singula*, Wlk., *C. arche*, Wlk.

Found also in Australia.

56. *M. muta* = *Cicada muta*, Wlk.

Four specimens from Mr. Wakefield may belong to this.

57. *M. ? nervosa* = *Cicada nervosa*, Wlk.

I do not know whether this is a *Melampsalta*, but the probability is that it, like all the species of the family I have seen, belongs to that genus.

58. *M. cruentata* = *Cicada cruentata*, Wlk., *C.* [illegible], Wlk., *C. bilinea*, Wlk.

59. *M. strepitans* = [illegible] *strepitans*, [illegible].

60. *M. Mangu*, n. sp.

Black, with long black and grey hairs, and fine pale pubescence. Markings red, but many of them often obsolete; when present they are—the sides of the front, the sides of the vertex above the antennae, and a spot at the base of the vertex, a broken line on all the margins of the pronotum and a short central line on its disc, a short line on each side of the base of the scutellum and a cross-shaped mark at the apex of the same part, the hind margins of the abdominal segments above very narrowly and some more distinct spots on the sides of the last (♂) or last two (♀) segments. These markings are often more or less absent or are (in some specimens) yellow instead of red (faded colour?). Under-side pale, with a grey fringe. Legs pale grey, coxae with large black spots; trochanters and femora with black streaks; tibiae with black streaks and rings; tarsi piceous towards the apex; front femora with three black spines below. Tegmina and wings vitreous; costa and veins testaceous, more or less tinged with red, black beyond the middle.

♂. Operculum small, whitish, transverse, broadly rounded at the apex.

♂ ♀. Length 17—21; exp. tegm. 38—40 mm.

Four specimens from Mr. Wakefield, labelled "On rocks at s Pass, Canterbury, about 3500 feet."

o another species much resembling *M. Mangu*, but larger t altogether black.

Fam. CERCOPINA.

Sub-Fam. APHROPHORIDAE.

ra *jactator*, n. sp.

g, fuscous-brown, with a faint greyish-green tinge, shining, almost al thickly punctate; tegmina rather obscurely variegated with two pale blotches on the front margin, the first of which is und, and larger, triangular; between the pale blotches whose apex separates them. Legs with obscure l in front, breadth nearly double the length;

pronotum with an obtusely angular front margin, much broader than the head with the eyes, disc more remotely punctured.

Length, ♂, 10, ♀, 11—12; breadth, ♂, 4½, ♀, 5 mm.

Captain Broun (many specimens). Not unlike, in some respects, *A. alni* in colour and markings. The structure, however (especially the ♂ genitalia), is quite different.

65. *Philænus fingens* (= *Ptyelus fingens*, Wlk.).

Several specimens from Captain Broun. Markings often faint.

66. *P. subvirescens* (= *Ptyelus subvirescens*, Butler, *Aphrophora subvirescens*, A. White, MS.).

Captain Broun (one specimen). Mr. Butler suggests that *P. fingens* is possibly a variety of this. Having but a single example I can scarcely judge (nor can I dissect it), but my impression is that they are distinct. Should they prove to be the same, *fingens* has the priority.

67. *P. trimaculatus* (= *Ptyelus trimaculatus*, Butler, *Aphrophora trimaculatus*, A. White, MS.).

Messrs. Broun, Hutton, and Wakefield. Common and variable.

Fam. JASSINA.

Sub-Fam. JASSIDÆ.

68. *Dorydium Westwoodi*, *n. sp.*

Pale yellowish-ochreous; head with a very slight tinge of brown; tarsi claws pale brown. Head and thorax finely punctate; tegmina coarsely reticulate-punctate or cribose between the veins. One example has a brown intramarginal streak from the base to the apex of the tegmina.

Length, 14; breadth at base of tegmina, 2; length of head, 4 mm.

Three specimens from Mr. Wakefield, with the ticket "Found by Mr. Fereday near Christchurch." This curious species strongly resembles the seed of one of the larger grasses.

69. *Athysanus negatus*, *n. sp.*

I have not enough material to describe this species at length. It is pale rufous-brown, with no distinct markings; some indistinct spots on the pronotum, spines of the hind tibiæ, and apex of the tarsi, rather darker, as well as the veins (♀) or some minute specks near the veins (♂) of the tegmina. ♂, back of abdomen black, apical segments testaceous; ♀, back of abdomen pale brown.

♂ ♀. Length, 5 mm.

Prof. Hutton (three specimens—two fragmentary).

Fam. FULGORINA.

Sub-Fam. CIXIIDÆ.

Mr. Walker described 7 New Zealand species as belonging to the genus *Cixius.* Of these, one certainly, and another probably, belong to *Oliarus* ; a third is, I think, the type of a new genus ; and the remaining four I know nothing about, but one or more of them probably do not belong to the genus *Cixius.*

70. *Oliarus oppositus* (= *Cixius oppositus*, Wlk.).

71. *O. marginalis* (= *Cixius marginalis*, Wlk.).

Some specimens from Mr. Wakefield agree pretty well with Mr. Walker's description.

AKA, *n. g.*

Body oblong. Head narrower than the pronotum, vertex obtusely prominent between the eyes, hind margin angularly sinuate, disc with a central longitudinal keel, and on each side a stronger one, which meet each other and the central one at the front margin ; in front of these are three oval pits, of which the central one is much the smallest. Frons and clypeus strongly elliptic, with raised side margins and central keel, which, on the half of the frons nearest the vertex, becomes forked. Antennæ small, 2nd joint globose. Eyes emarginate below. Ocelli apparently two. Pronotum with a strong central keel, and one on each side, which, arising from the front margin near the central keel, makes a double curve and ends near the hind angle. Scutellum with a central keel vanishing before the apex, and an oblique curved one on each side. Tegmina rather clasping the body, costal margin slightly rounded. Hind tibiæ unarmed.

Allied to *Myndus*, Stål. From the Maori "*Aka*," angular. Type *Cixius finitimus*, Wlk.

72. *Aka finitima* (= *Cixius finitimus*, Wlk.).

Mr. Wakefield (four specimens).

73. *Cixius, sp.* ?

Three specimens from Professor Hutton, but not in condition to be described.

74. *Cixius punctimargo*, Wlk.

75. *C. interior*, Wlk.

76. *C. aspilus*, Wlk. Probably not a *Cixius*.

77. *C. rufifrons*, Wlk.

SEMO, *n. g.*

Body oblong. Head rather wider than the pronotum, distinctly roundly prominent between the eyes. Vertex transversely oblong, crossed by two somewhat curved transverse keels, in front of the middle of the anterior of which is a small depression at the base of the frons; hind margin straight. Frons trapezoidal, broader at the apex, where its produced sides clasp the clypeus on each side; sides sharply margined; disc very convex. Clypeus exceedingly convex, almost semi-globose, with sharply margined sides. Eyes somewhat sinuate below. Ocelli two. Antennæ inserted below the eyes, short, 1st joint obscure, 2nd globose. Pronotum short, with two point-like depressions behind the centre of the front margin on each side of the obscure longitudinal keel; hind margin angularly sinuate. Scutellum with three keels, the central faint and almost or quite vanishing beyond the middle. Tegmina narrow. Hind tibiæ with three teeth.

Somewhat allied to *Duilius*, Stål.

78. *Semo clypeatus*, *n. sp.*

Pale ochreous-brown. Head (except the keels of the vertex, sides of the frons, a longitudinal central line on the frons, and the antennæ), scutellum (except the side margins), apex of the tarsi, and abdomen (except the genitalia), more or less piceous or piceous-black. ♂ ♀. Length, 4—5; breadth, 2 mm.

Professor Hutton (four examples).

Sub-Fam. ACHILIDÆ.

AGANDECCA, *n. g.*

Body oblong. Head narrower than the pronotum; vertex transverse, much broader than long, very obtusely angularly prominent between the eyes, disc hollowed, with an obsolete central longitudinal keel, strongly transversely keeled in front, and with two triangular pits between the keel and the frons, hind margin angularly sinuate. Frons and clypeus narrowly elliptic, with central keel and keeled margins; base and apex of frons equally broad. Eyes rounded, scarcely emarginate below. Antennæ short, 2nd joint sub-globose. Pronotum very short, with central keel and oblique curved side keels, which do not reach the deeply angularly-sinuate hind margin. Scutellum nearly equally long and broad, with three straight keels. Tegmina rounded at the end; radial and outer ulnar veins joined near the base, the radial and inner ulnar forked before the middle of the tegmina; several long and irregular cells before the rather numerous apical cells. Hind tibiæ with one small spine and the usual apical coronet.

Allied to *Messeis*, Stål. The formation of the head and thorax *is much like that of Cixius.*

79. *Agandecca annectens, n. sp.*

Pronotum rufous-testaceous, with paler keels; head yellowish-testaceous, darker between the keels; tegmina smoky-yellowish, with the veins marked here and there with whitish; veins near the inner angle of the clavus sometimes conspicuously pale, commissure of clavus from the middle to the apex piceous; legs brownish-testaceous. ♂. Length, 5; breadth, 2 mm.

Professor Hutton (several specimens).

Sub-Fam. RICANIIDÆ.

80. *Ricania australis* (= *Pochazia australis*, Wlk.).

Taken by Mr. Lawson upon dahlias (Mr. W. L. Distant, Trans. Ent. Soc. Lond., 1878, Proceed., p. xxxix).

Sub-Fam. DELPHACIDÆ.

CONA, *n. g.*

Body oblong-oval. Head much narrower than the pronotum; vertex sub-quadrate, less than half the breadth of an eye, hind margin between the eyes, which extend for more than half their length behind it, straight; disc with a somewhat A-shaped keel (decidedly narrowed beyond the cross of the A), and a weaker longitudinal keel which is sometimes obsolete. Frons elliptic, truncate at each end, sides sharply keeled, centre with two (approximate) longitudinal keels gradually meeting at base and apex. Clypeus with keeled margins and convex or obtusely keeled disc. Antennæ long, equal in length to three-fourths of the clypeus and frons taken together, slightly compressed, 1st joint widened upwards, 2nd joint a little longer than the 1st. Pronotum short, more than four times broader than long, front margin truncate behind the vertex; with a central longitudinal keel, and a keel on each side which, starting from the centre of the front margin, goes in a double curve to the hind angle. Scutellum with five keels, the outer one on each side more oblique, the intermediate sometimes rather obsolete. Tegmina in macropterous (♂ and ♀) examples a little longer than the abdomen, rounded at the apex; clavus with two veins which unite beyond the middle, the single vein thus formed ending on the inner margin before the apex; corium with three veins united near the base, the outer vein forked before, and the inner beyond, the middle; six long apical cells; neuration sometimes, but rarely, variable. In brachypterous (♀) individuals, the tegmina are about half the length of the abdomen, truncately rounded at the apex, with the clavus and corium connate, and the neuration rather confused. Wings in macropterous examples about three-fourths the length of the abdomen.

81. *Cona cælata, n. sp.*

Dirty pale brown, more or less spotted and blotched with darker brown. Antennæ, second joint with one or two rings (sometimes obsolete, sometimes covering nearly all the joint); legs with rings, spots and streaks fuscous-brown. Tegmina very variable in colour, often hyaline or fuscous-hyaline, with the veins spotted with piceous-brown, sometimes much clouded with pale or dark piceous-brown, and the veins altogether dark; generally, but not invariably, the areas of the apical cells are clear hyaline. Back of abdomen paler in the centre, the sides with pale and dark streaks. Head, pronotum, scutellum, and hind margin of the abdominal segments, sometimes with red streaks. In macropterous examples, the central keels of the pronotum and scutellum, and the keels of the frons, are generally bright red; legs rarely tinged with red. ♂ ♀. Length, 4½—6; breadth, 3 mm.

Captain Broun (many specimens). Very variable in the markings. In brachypterous specimens, the antennæ are shorter and thicker than in macropterous.

ENUMERATION OF THE SPECIES MENTIONED.

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In the list now concluded, I have not thought it necessary to indicate specially the localities whence the insects came; in the first place, because, with our as yet limited knowledge, such details would be of little value, and, secondly and chiefly, because I have little or nothing to tell.

In a broad way, I may say that Mr. Wakefield's specimens came principally from Wellington or Canterbury; Captain Broun's from Auckland; and Professor Hutton's from Otago.

Most of the species previously recorded have no special indication of locality, but some of them, such as *Calliphara imperialis*, must have, I suspect, been found in the northern part of Auckland, where alone, it is likely from their sub-tropical character, they would find a suitable habitat. Further investigations will, however, doubtless throw light upon this point.

What the total number of the New Zealand *Hemiptera* may prove to be, it would be useless to attempt to guess; but if the investigations of the three gentlemen to whom I have been so much indebted have resulted in nearly doubling the number previously recorded, and that without any special attention on their part to the *Hemiptera*, more extended researches ought, it may be expected, not perhaps to again double the list, but, at any rate, to considerably increase it.

In conclusion, I may say, that I will, at all times, be happy to examine and name any specimens of New Zealand *Hemiptera* that may be entrusted to me.

Perth: 1878.

ON THE PUPATION OF THE *NYMPHALIDÆ*.

BY W. H. EDWARDS.

(*Extracted from the "Canadian Entomologist," December*, 1878).

[The author commences by reprinting Dr. Osborne's paper in the Entomologist's Monthly Magazine for October, 1878 (vol. xv, pp. 59–61), and goes on to say:—]

As soon as I read this communication, I sought for butterflies of this family, and soon took females of *Grapta interrogationis* and *Danais Archippus*. The former laid many eggs in a bag, tied over a stem of hop, and the other a few on *Asclepias*. The larvæ from both lots have *finished their* pupation, and I have carefully watched the process. *Dr. Osborne's* statement is correct. The chrysalis of Grapta is supported by a narrow, white membrane or ligament, about one-tenth inch long, one end of which is pointed and fastened to the inner side of the larval skin near the extremity thereof, and the other is forked and fastened to the ends of two curved, slightly raised, longitudinal ridges, which are to be found on the ventral side of the last segment. These ends are at the anterior edge of the segment. They project sufficiently to form hooks, as it were, which hold the membrane firmly. In *Archippus* the ligament is much larger and stronger than in *Grapta.* It is broad, black, and deeply forked where it attaches to the segment. In this species, instead of low ridges, there are two rows of shining black processes, three in each row, and the outer pair are knobbed, and a little pointed anteriorly. On these outer knobs, the ligament is fastened. I do not believe that the chrysalis of *Grapta* ever seizes the loosened skin *for a support*—at any rate any support that such a hold could furnish is not essential, for I have repeatedly raised the skin with forceps entirely off the abdominal segments on the ventral side, so as to discover the distended membrane, and in several cases have cut the skin off just below the membrane at the instant the effort was beginning, for freeing the tail. In these last cases the chrysalids were seen to be connected with the skin by the membrane only, and the membrane is the lever by which the chrysalis climbs to the silk. There could not possibly have been any other support.

Réaumur's account of the pupation of the *Suspensi* was drawn up after very extended observations on larvæ of several species of *Vanessa* principally (he says, several hundred caterpillars), and is given at great length. Similar statements are given by subsequent authors, often based on direct observation, but so far as I can discover, one and all describe the process as it would appear to a looker on. I noticed in Westwood and Humphrey's British Butterflies, p. 54, what is doubtless an inadvertent error:—"The chrysalis carefully withdraws its tail from the skin, *seizing hold of the outside* of the latter by pressing two of the rings of its body together, and enclosing between part of the old skin. *By repeating this process*, it at length pushes its tail upwards, till it reaches the silken button," &c. For *outside*, read *inside.*

Dr. Harris, Ins., 2nd ed., p. 282, gives an account of the transformation of *Archippus* with much detail.

"By bending together two of these rings near the middle of the body, the chrysalis seizes, in the crevice between them, *a portion of the empty skin and clings to it so as to support itself* while it withdraws its tail from the remainder of the skin. It is now wholly out of the *skin, to which it hangs suspended by nipping* together the rings of its *body*; but as the chrysalis is much shorter than the caterpillar, *it is yet at some distance from the tuft of silk, to which it must climb. To do this, it extends the rings of its body as far apart as possible, then, bending together two of them above those by which it is suspended, it catches hold of the skin higher up, at the same time letting go below, and by repeating this process with different rings in succession, it at length reaches the tuft,*" &c. "We may see the whole process in the caterpillars of *Archippus*," &c. Dr. Harris drew his description from nature, and was too careful an observer to commit himself in a case like this beyond what he thought he clearly saw.

In Butterflies of N. America, vol. i, I gave an account of the transformation of *Grapta comma*, taken strictly from my own observations. In this I find no mention of the climbing by the aid of the successive pairs of segments, described by Dr. Harris as taking place in *Archippus*, but otherwise my statement agrees substantially with his. I had previously read of the transformations of butterflies in various works, and so was doubtless prepared to receive the common version of the mode, but I described precisely what I thought I saw. I have heretofore repeatedly witnessed this process in various genera; but I find by recent experience that it is impossible with a single observation, or by half a dozen, to determine all the details, and only by watching one point in one example and another in the next, and verifying each again and again, could I feel sure that I had made myself acquainted with this part of the history of a single species. I have watched sixteen transformations of *interrogationis* and two of *Archippus* during the last few days, and will describe at length what I have seen. It may serve to show how the error spoken of originated and has been perpetuated by so many observers, and for more than a century, with no suspicion of wrong till Dr. Osborne made his discovery. In *interrogationis* the period of suspension varies from six to twenty-four hours, according to the state of the weather and degree of warmth. My first observations were made under a clear sky, and mercury about 80° Fahr., in the middle of the day; the latter ones in cool and rainy weather, with cold nights. The larva of this species is suspended from a button of pink silk. At first it holds itself in a circular shape, its head turned in against segments 11 and 12, the lowest part of the curve being at 7th. After two hours, more or less (in warm weather), the curve is relaxed, and the attitude resembles figure 6, the dorsum on last segments being convex, the head turned in opposite 8 and 9, the lowest part of the curve being at 6th. Two or three hours later the body hangs straight, and the four anterior segments are bent almost at a right angle to the others. The head continues to droop, and by this it is made certain that the final change approaches. Presently there is a twitching of the spines, first confined to one segment, but extending soon over the whole body, and changing into a waving motion. This is accompanied by a twisting of the segments beneath the skin, which increases in strength and continues some minutes. Two or three times a spasm of contraction comes on, by which the body is lifted up into the last one or two segments and let fall again. Then a creeping movement under the skin commences, extending from the posterior segments forward, and seems to break the skin loose from the body, and one wave after another runs along till the distended skin on the anterior segments bursts. This always takes place on the middle of the dorsum, on the 3rd segment, and the mesonotum of the chrysalis is forced through, splitting the skin up to the head (or first segment), and sometimes splitting the skin of the head also. By the continued creeping movement, the body is slowly forced through the rent. As this is oblique, the ventral side of the chrysalis is fully three segments behind the dorsal in the divesting, the skin on the anterior segments fitting tight as a glove, although it is loosening and packing in a mass about the anal feet. In about ninety seconds from the time of the rupture the skin on the dorsal side has been pushed back to 10, and the effort begins for the extrication of the tail of the chrysalis from the caterpillar skin. This tail must be withdrawn and fastened outside the skin to the same button of silk which the caterpillar clung to. At this instant the skin covers the ventral side of the chrysalis to 8th segment, but is moving up constantly, and as the chrysalis bends the posterior half of the abdomen sharply back to force the tail out of the sheath, the segments are pinched together and there is at the same time a pinching in of the skin. But there is no seizing of the *outside* of the skin; if there were no other reason, the spines would make this impossible. The tail now free, the chrysalis straightens itself up, and swinging on the ligament, lifts itself towards the silk, the last segment describing an arc of a circle of which the ligament is the radius, and the tail, which at the same instant is curved forward, is brought round and over the considerable packet of the old skin and with precision strikes the silk. An observer, knowing nothing of the ligament, seeing only the violent contortions, the abdominal segments expanding and contracting to the utmost, while at the same time the chrysalis steadily rises toward the silk, naturally concludes that the one movement is the direct result of the other. When I lifted the *flap of skin entirely* clear of the struggling segments and cut it off a little below the tail, the bendings and contortions were not interrupted by my interference, nor was the effort to reach the silk in the least abated. Held firm by the stretched ligament, which was in plain view, the body rose, and the tail, which had got well outside the padded skin, and was before complete extrication bent backward, now bent forward, and by the upward swing was brought exactly to the silk. Several times as I was lifting, the skin and chrysalis together were dislodged, and fell into my hand. Then by drawing the skin back the ligament was exposed and it was distinctly seen that it was attached to the chrysalis by the pointed ends of the ridges before mentioned, and that there was no other connection between skin and chrysalis.

After the hooklets of the tail are caught in the silk, the chrysalis whirls one way and then the other, the last segments actively twisting and screwing in order to fasten the hooklets more securely. This movement does not seem to be made for the purpose of rupturing the membrane or for getting rid of the old skin especially, for I noticed that whenever the skin parted and fell just as the silk was grasped, as did sometimes happen, the same whirling, and all the movements usually seen, followed. It is a wonderful exhibition, and the last act is beyond my comprehension,—namely, the rising of the chrysalis with no external aid save what comes from the ligament. I can only state the fact.

When the rupture of the skin of the caterpillar of *interrogationis* first takes place, and the mesonotum is made to appear, this organ is pressed down and flattened, but in a short time, and before the transformation is completed, it swells out, and becomes nearly as large and as prominent as it ever will be; the head case is pushed forward on the thorax and jammed in, so that on first issuing, the chrysalis is truncated at the anterior side of the mesonotum. When the skin is thrown off, the chrysalis hangs limp and distended, like a long cone, with no prominences except the mesonotum. Presently the segments shorten and become broader, the ends of the wing cases creep nearer the tail, the tuberculated points on the abdomen swell out, the head case pushes up, with its palpi cases, and in course of half an hour the final and characteristic shape is assumed. The change in these respects is nothing like so striking in *Grapta* as in *Limenitis*, where the chrysalis is greatly hunched and displays a prodigious mesonotum. In this case the chrysalis is at first as limp and shapeless as in *Grapta*, but reaches its proper form in the same way; the segments contracting and the processes growing and maturing as one looks at them.

The transformation of *Archippus* presented a close resemblance, but some differences. When first suspended, which it did from a pad of white silk, the larva took the attitude of an oval, the head brought near 12th segment; a few hours later that of figure 6; and finally of a right angle, the head continuing to droop. During the last two hours there was a constant move of the head, which seemed to rub itself on the anterior legs, and several times and up to within one-half hour of the change, the larva doubled itself up and brought its head to the button of silk, as if greatly annoyed at something there. This I noticed in both the larvæ observed. Finally, the body was contracted and lifted up as in *Grapta*, and a slight creeping movement was seen, but there were no twitchings or twistings as in *Grapta*. The creeping became stronger, advancing in waves, and the strain on the anterior segments became severe, till the skin burst on the dorsal line of 2, 3, and 4, and the top of the head also was rent. The slit was oblique, and the ventral side was covered three segments beyond the dorsal. When the body was exposed on dorsum at 10 and 11, the ventral side was covered at 8 and 9, and the skin fitted tight, so that as the body bent back in the movement to free the tail the skin was pinched between the segments. The struggle became violent, the segments all along the abdomen stretching to the utmost, and then contracting forcibly, *one telescoping into the next; and in this the skin followed the segment, and was drawn in and held for an instant.* As this movement ran through the segments successively, the skin was pinched at one joint after another, and the chrysalis was evidently rising towards the silk as described by Dr. Harris. Unfortunately I was able to see the transformation in but two examples of *Archippus*. In the first one, I set myself to see how the whole change must have appeared to Dr. Harris, as he had described it minutely. In the next one I lifted the flap of skin till I saw the ligament. In so doing the whole thing unhooked from the silk, and as it lay in my hand I pulled back the skin and was able to look at the ligament with a lens. I also lifted the chrysalis by the skin, and the ligament did not part. It did so afterwards only by a strenuous effort of the chrysalis, and then remained distended, with its forks in shape. The nature of this organ must be determined by further observations. I had sent to a friend, who is an experienced microscopist as well as entomologist, a chrysalis of *interrogationis* which had been dropped in glycerine at the crisis of pupation, and he writes me thus:—"I have examined the preparation, which was in good condition except the separation of the chrysalis from the skin. I see what you call the two ridges, which exist also in the caterpillar *and have between them* the anus in both caterpillar and chrysalis.

Further, I find connected with the skin the whole rectum, and a little more of the intestinal canal, drawn out in pupation. A little below I see a substance which I suppose to be your membrane, about as long as the rectum, and structureless. I would suppose that the membrane belonged to the rectum and perhaps the external cover of it, if you had not written that the membrane in *Archippus* is black. I took a caterpillar (in spirits) of this species, and opening it, found that the rectum was white, or at least light colored. One should make a section of the caterpillar of *Archippus* just after suspension to discover where this black membrane comes from. The use and purpose of the knobs and bars in the chrysalids is doubtless this: in these organs are built up and developed the anal appendages of the imago."

Coalburgh, U. S. A.: *September*, 1878.

INTRODUCTORY PAPERS ON FOSSIL ENTOMOLOGY.

BY HERBERT GOSS, F.L.S., F.G.S.

No. 5.

Palæozoic Time.

[*On the Insecta of the Permian Period, and the animals and plants with which they were correlated.*]

The Permian* Period—which brings us to the close of the Palæozoic Age—was one of transition towards a new epoch in the world's history, in which a number of old types of animal and vegetable life appeared for the last time.

Although the Permian rocks in many instances pass upwards conformably into the Trias, the difference between the fauna and flora of the two Periods is distinctly marked, the fossils of the former being more nearly allied to those of the Carboniferous Age, than to those of the latter or any succeeding series.

The Permian rocks are extensively developed in Russia and Germany, and they also occur in some parts of Great Britain and North America; but from their comparatively limited geographical and superficial range, the number of fossils obtained from them is proportionately small, and of the *Insecta* only about thirteen species have been discovered, all of which were found in that part of Germany† which has been styled by Lyell‡ "the classic ground" of this formation on the Continent.

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* This formation was so named by Sir R. Murchison, F.R.S., on account of its being more developed in the Province of Perm, in Russia, than anywhere else.

† *Schwarzenbach*, near Birkenfeld, Cassel; Weissig, near Pillnitz, in Saxony; Stockheim, in *Thuringia*, &c.

‡ "*Elements of Geology*," 6th edit., p. 460.

One of the first discovered, and by far the most interesting of these insects, was obtained from an ironstone-pit, belonging to Herr Böcking, at Schwarzenbach, in the district of Birkenfeld, and was described, in 1866, by Dr. Anton Dohrn,[*] who named it *Eugereon Bœckingi.*[†]

Dr. Dohrn states that Herr Tischbein and Dr. Hagen both regarded this insect as an Hemipteron, and he adds that he was originally of the same opinion, but that after a further examination of this remarkable fossil, he decided that it could not be referred to any existing Order, as it combined characters both of the *Neuroptera*[‡] and *Hemiptera.*

Dr. Dohrn does not, of course, regard *Eugereon* as a type of the common ancestor or progenitor of the *Neuroptera* and *Hemiptera,* as both these Orders were already in existence; but he is of opinion that, at a very remote period, a form existed completely intermediate between these two Orders, from which they were differentiated, and from which *Eugereon* was also descended.

As this insect could not be referred to any existing Order, it was placed by its describer in a new Order, which he created for it, and which he named *Dictyoptera* ; it has recently been included by Dr. Goldenberg in his Order *Palæodictyoptera.*[§]

Another fossil, scarcely less interesting than *Eugereon,* discovered by Herr Carl Rückert in the neighbourhood of Stockheim, in Thuringia, was described, in 1865, by Dr. H. B. Geinitz,[‖] who named it *Ephemerites Rückerti.* From its union of characters of the genera *Ephemera* and *Libellula,* Dr. Goldenberg has recently placed this fossil in his Order *Palæodictyoptera.*

A fragment of a wing, obtained from Weissig, near Pillnitz, in Saxony, has been referred, by Herr Eugen Geinitz,[¶] to a species of *Hemiptera—Fulgorina Klieveri* ?—a specimen of which has been also obtained from the European Coal-measures, and was alluded to in the preceding paper[**] " On the *Insecta* of the Carboniferous Period."

Dr. Goldenberg has recently informed[††] me that he is not aware of any specimen of the last named species (*F. Klieveri*) having been discovered in Permian strata ; but his opinion is that the two species of *Fulgorina,* referred to in the last[‡‡] paper—viz., *F. Ebersi* and *F.*

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[*] " Palæontographica," vol. xiii, p. 333, 1866.

[†] For a description of this fossil see " Palæontographica," last *cit.* ; also vol. xvi, p. 129, 1869, the " Stettiner Ent. Zeitung," Jahrg., xxviii, 1867 ; and Goldenberg's " Fauna," pt. 2, *antea cit.,* pp. 11—14.

[‡] It will be remembered that all the synthetic types, previously alluded to, exhibited a union of the characters of *Neuroptera* and *Orthoptera* (see *ante,* papers Nos. 3 and 4).

[§] Fauna Sar. Foss , pt. 2, 1877, *antea cit.,* p. 50.

[‖] Neues Jahrb. für Min., &c , 1865, pp. 335—388.

[¶] See Neues Jahrb. für. Min., &c., 1875, pp. 6 and 12, and plate i, fig. 3, p. 112.

[**] See *ante* p. 171 of this vol.

[††] *in litt., 12th January, 1879.*

[‡‡] *See ante p. 171.*

lebachensis—were obtained from the Permian[*] and *not* from the Coal-measures.

The nine other insects discovered in strata of this Age all belong to the extinct genus *Blattina*, of the Family *Blattidæ* of the *Orthoptera*, and the majority of them were obtained from Weissig. Of these *Blattidæ*, five species — *Blattina weissigensis*,[†] *B. porrecta*,[‡] *B. Rückerti*,[§] *B. lebachensis*, and *B. gracilis*—are new to the list of Palæozoic *Insecta*; but specimens of the remaining four, viz., *B. didyma*, *B. anthracophila*, *B. carbonaria*, and *B. Mahri*, have also been obtained from the European Coal-measures, and were included in the 30[||] species referred to in the paper last mentioned. The specimen of *Blattina didyma*[¶] from the Permian is, for an insect of such vast antiquity, in an unsually perfect state of preservation, the body, wings, and legs being almost entire; but the other *Blattidæ* are represented only by single wings, or parts of wings, and are of no special interest.

The *Protozoa* of this Period are principally represented by *Foraminifera*, and the *Cœlenterata* by a few sponges and corals. The *Arthropoda* include *Crustacea*, *Insecta*,[**] and *Myriopoda*[††]: but no traces of *Arachnida* have, I believe, been met with, and the *Crustacea* are much rarer than in any former Age, several Families having entirely disappeared. The *Mollusca* are tolerably abundant, especially *Brachiopoda* and *Lamellibranchiata*.

By far the most interesting fossils of this age belong to the *Vertebrata*, and include fishes—which are comparatively very abundant, Amphibians—various forms of *Labyrinthodontia*, and Lacertian, or lizard-like Reptiles.

The Permian flora was closely allied to that of the Upper Carboniferous rocks—though most of the species were distinct—and included ferns, tree ferns, *Equiseta*, *Calamites*, and numerous Cycads and Conifers; there were also several forms which had not been previously met with.

As already observed, the character of this Period was one of transition: "the old[‡‡] or Palæozoic World was passing by, while within "it new types had come forth prophetic of the earth's brighter future."

The Avenue, Surbiton Hill:
24th January, 1879.

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[*] Assuming Dr. Goldenberg to be right, we have thirteen fossil insects from the Permian of Europe, viz., two *Palæodictyoptera*, two *Hemiptera*, and nine *Orthoptera (Blattidæ)*.

[†] Described by Herr Eugen Geinitz in Neues Jahrb. für Min., 1873, pp. 692—694.

[‡] Eugen Geinitz in Neues Jahrb. für Min., 1875, p. 6.

[§] Described by Dr. Goldenberg in Neues Jahrb. für Min., 1869.

[||] See *ante* p. 171.

[¶] See Neues Jahrb. für Min., 1875, *antea cit.*, plate i, fig. 1, p. 112.

[**] *The thirteen* species before referred to.

[††] *See a paper by Dr. H. B.* Geinitz, entitled "Fossile Myriapoden in dem Rothliegenden bei *Chemnitz," in "Sitzungs*-Berichte der naturwiss. Gesellsch.," Dresden, 1872, pp. 126—131.

[‡‡] *Prof. Dana in his* "Manual of Geology," 2nd edit., antea cit., p. 371.

SYNONYMICAL NOTES ON THE SPECIES OF *SWAMMERDAMIA*.

BY E. L. RAGONOT.

In working out the life histories of the European *Micro-Lepidoptera*, I had been struck with the confusion which exists on the synonymy of the species of the genus *Swammerdamia*, and two years ago I submitted to Prof. Zeller my views on the subject.

The confusion has been caused by the inaccuracy of the figures in Hübner's work, a change he made in the names in his catalogue, and also by the variability of the species, particularly *cæsiella*, Hb. (*griseocapitella*, Stn.).

Hübner figures three species, viz., *cæsiella*, Hb., with a white head and grey thorax (fig. 172); *cæsiella*, Hb. (fig. 360), with a white head, thorax and inner margin; and *cerasiella*, Hb. (fig. 332). Of these he describes only the first, thus: "Fig. 172, *Tin. cæsiella*. The head is white, but the thorax and upper wings are of a bluish-grey colour, the latter have a brownish band in the middle, and a white spot on the costa of the wings; the under wings and the abdomen are ashy-grey."

This description applies well to the variety of *griseocapitella* which has the thorax grey, but it suits still better *oxyacanthella*, Dup., and I would be inclined to give the name of *cæsiella* to this species, were it not that tradition makes the birch feeder (under the name of *Heroldella*) the true *cæsiella* of Hübner, and that the birch feeder has often a grey thorax.

In his "Verzeichniss bekannter Schmetterlinge," Hübner retains the name of *cæsiella* for his fig. 360; whilst, further on, in his genus *Swammerdamia*, he changes the name of his fig. 172 to *Heroldella*, which he places next to his *cerasiella* (fig. 332).

Treitschke, following Hübner, describes the birch feeder under the name of *Heroldella*, so do Fischer von Röslerstamm and Duponchel; but as Hübner, according to the rules of nomenclature, had no right to change a good name once given, we must drop the name of *Heroldella* and retain that of *cæsiella* (the earlier name) for the birch feeder, which name is used by Herrich-Schäffer, Frey and Heinemann. These authors, however, seem to have entirely overlooked Hübner's fig. 172, which is the type of the species, and refer only to his fig. 360, which, I consider, represents better the sloe feeder (*spiniella*). *Griseocapitella*, Stn., may be retained as a variety of *cæsiella*, Hb., with brownish frontal tuft and dark thorax. *Nubeculella, Tgst.,* would be a synonym of *griseocapitella*.

This species varies considerably: the head and thorax are sometimes quite white; at other times only the head is white; some specimens have the centre of the head brownish; and others have the thorax pale grey or whitish. The fore-wings are generally paler on the inner margin, but some specimens are of a uniform grey colour. It is because this species varies so much that I would quote the descriptions of the above authors, although they refer to the wrong figure in Hübner's work.

The following is the arrangement I have adopted in my collection, and it appears to me to reconcile the different classifications, and render to each species its particular food plant:

FORE-WINGS WHITISH OR VERY PALE GREY.

1. *alternans*, Stgr., Frey. Larva unknown. Switzerland.
2. *alpicella*, H.-S. Larva unknown. Alpine Germany.
3. *conspersella*, Tngst., Wk., Nolcken. Larva on *Empetrum nigrum*. Russia, Norway, and Lapland. The larva is "of a dirty pale greenish-yellow colour, with the head, a fine dorsal, and two broad sub-dorsal stripes, of a brown-red colour" (Nolcken).

FORE-WINGS GREY.

Head and thorax white.

4. *spiniella* (Hb., Gesch. larva), Zeller, 1871, = *cæsiella*, Hb., fig. 360, Stainton in part (the ♂). Larva on *Prunus spinosa*. Europe. I have a specimen bred from *Cratægus oxyacantha* which I also refer to this species, distinguishable by its two white costal spots. [These two costal spots are well seen in Hübner's figure 360.—H. T. S.] The larva is "reddish-brown, with a broad, ill-defined, pale dorsal line, and a broad yellowish-white spiracular stripe" (Barrett); head pale ochreous-yellow.
5. *nanivora*, Stn. The larva feeds on *Betula nana*, and is "pale reddish-brown, with dark red-brown slender dorsal and broad sub-dorsal stripes; head black" (Stainton). Scotland and Esthonia.
6. ? *variegata*, Tngstr. Unknown to me. Livonia.
7. *lutarea*, Hw., Stn., Hein., = *compunctella*, H.-S., Hein. Europe. The scapulæ are grey, and sometimes the head and thorax are yellowish. The larva feeds on *Sorbus aucuparia*; it is "greenish with a whitish-orange, posteriorly brownish-orange, dorsal, and reddish-brown sub-dorsal, stripes, and whitish spiracular line; head pale brownish-yellow" (Nolcken).

Head white, thorax dark.

8. *oxyacanthella* (Mann.), Dup., H.-S., Frey, Hein., Zeller, = *cæsiella*, Stn. (in part ♀). The larva feeds on *Cratægus oxyacantha*, and I have reared it from *Pyrus malus*. The larva is "dark red-brown with no dorsal stripe, but with *a broad yellowish*, posteriorly reddish, spiracular stripe" (Barrett), *head pale brown*.

9. ***pyrella***, Vill., Stn., Hein., = ***cerasiella***, Hb., F.-R., Tr., Dup., Frey, H.-S., = ***cæsia***, Hw. The larva on apple, pear, cherry and hawthorn, and probably on other fruit trees, though Prof. Zeller says he has only bred it from apple. It is "sulphur-yellow, with dark red-brown sub-dorsal stripes, and pale reddish-brown bands on the 4th to 12th segments" (Stainton).

Head and thorax white, whitish or greyish.

10. ***cæsiella***, Hb., fig. 172 (nec fig. 360), H.-S., Frey, Hein., = *Heroldella*, Hb., Verz., Tr., F.-R., Dup., Zeller, var. *griseocapitella*, Stn., H.-S., Hein., ***nubeculella***, Tgstr. The larva feeds on *Betula alba*. It is pale green, with darker dorsal and sub-dorsal lines; head yellowish-brown.

FORE-WINGS GREY WITH THE TIP BRIGHT OCHREOUS.

11. ***combinella***, Hb., Btr., = ***comptella***, Hb., Z., H.-S., = ***apicella***, Don., Stn., Frey, = ***aurofinitella***, Dup. The larva feeds on *Prunus spinosa*. It is "pale yellowish, with a broad pale green dorsal stripe edged laterally by an interrupted brown-red line forming spots on each segment; head yellowish-white" (v. Heyden).

Another species (*Zimmermanni*, Now.), according to the description and figure, appears to differ from the other *Swammerdamiæ*, and has been placed by Nowicki in a new genus (*Kessleria*), but I have not seen it in nature.

I may add, that I noticed among Herr von Nolcken's types, two specimens of a species which I would be inclined to describe as new.

12, Quai de la Rapée, Paris:
4th February, 1879.

ON CERTAIN BRITISH *HEMIPTERA-HOMOPTERA*.

BY JOHN SCOTT.

Revision of the genus EUPELIX.

My last paper with the above title will be found at p. 276, vol. xii, of this magazine. Since that time, I have desisted from describing other British genera or species of this Order because I believed that the few remaining ones, which I had not noticed in my previous papers, were so well-known and understood by every student as to require no notice from me. Nor would I now have begun afresh, had I not had some reason for doing so. The genus *Eupelix*, of which I am about to write, has the peculiarity of having, so far as I am aware, only four species in the whole world, and singularly these are all European, *except E. marginata*, Fieb. The similarity of the species has given rise to grave doubts in the minds of some recent authors whether there were one or two of the species in Britain. But I am about to describe a third, and set forth characters whereby there may be no reason to doubt the identity of each of them, and I shall thus have removed an impression caused solely, I believe, by the want of a series of examples to enable authors to judge of their distinctness. The figures by Germar and Burmeister are sufficient for any one who possesses their works to see at a glance how the species may be recognised. The shape of the head being the character for which the word *Eupelix* was formed, I may here observe that although *helmet-shaped*, it much more resembles, to our ideas, a vertical section of a helmet.

Genus EUPELIX, Germar.

Germar, Mag. iv, 93, 22.

Head scutelliform, horizontal, apex slightly recurved; lateral margins sometimes slightly sinuate; down the centre a strong keel. *Frons* narrow, with a more or less strong central keel; lateral margins always exterior to the eyes. *Eyes* elliptical, nearly divided longitudinally into two pieces by the lateral margins. *Ocelli* slightly elevated, and placed a little beyond the middle of the lateral margin.

Thorax—pronotum transverse, with a strong central keel. *Scutellum* triangular, with an arcuate depression before the apex. *Thighs* without spines. *Tibiæ*; exterior margin with 4–5 spines. *Elytra* coriaceous; nerves prominent.

SECTION A.

Head broader than long.

Head testaceous, almost twice as broad (measured across the middle of the eyes) as down the centre, with dark brown or fuscous-black irregular markings next the anterior margin, and a somewhat cruciform-shaped patch of the same colour at the apex. *Elytra* testaceous, nerves finely granulated; in the centre of each granule a black dot; between the nerves, towards, and at, the apex, more or less sprinkled with black dots.

Abdomen: ♂, above black; lateral margins, a narrow line within the same, commencing at about the second segment, and another on each side of the centre, testaceous; genital segments testaceous; underneath testaceous, with a fuscous black streak on each side, narrowing towards the apex, side margins interiorly somewhat fuscous. Length, 2 lines............... 1. CUSPIDATA, Fab.
Germ., F. E., fasc. iv, fig. 22.

Sparingly at Boxhill in June, by searching at the roots of grass, *and below fragments* of chalk. Also in Scotland, by Dr. Reuter.

Easily distinguished from the following species by its broader head, and the characters thereon. The granulated nerves of the elytra and the black dots on the disc of the same, give to the insect a fuscous look.

Head testaceous, about one and a half times broader across the middle of the eyes than down the centre, with a more or less distinct, broad, fuscous line on each side of the central keel next the apex, and vanishing near the centre; a black spot on each side of the apex, and two others on the lateral margins going towards the ocelli, which last are perceptibly elevated; the margin exterior to the eyes dark brown or fuscous. *Elytra* and nerves testaceous. *Legs* testaceous. Length, 2½ lines..2. PRODUCTA.

Germ., F. E., fasc. iv, fig. 22; Burm., Gen. Ins., 1, figs. 1 and 5.

Very nearly allied to the next species, from which it may at once be distinguished by the difference in the length of the head, and the want of the sinuation of the lateral margins in that species.

Taken under similar circumstances to the species described above, and with the following one.

SECTION B.

Head longer than broad.

Head testaceous, longer than broad, lateral margins sinuate; central keel on each side more or less dark brown or fuscous from in a line with the anterior margin of the eyes to the apex; apex with a minute dark spot on each side. *Elytra* testaceous. *Legs* testaceous. Length 3 lines...... .... 3. SPATHULATA.

Germ., F. E., xxii, 25; Panz., F. G., 164, 19; Burm., Gen. Ins., 1, fig. 6.

The length of the head, and the sinuate lateral margins will enable any one to eliminate it from the specimens of *E. producta* which he may possess, and with which I believe it will often be found to be mixed.

Taken in company with the foregoing, at Sevenoaks, in August; also at Wingham, Kent, and Ardrossan, Ayrshire.

Both Mr. Douglas and I had put on one side examples of *E. spathulata*, about which we were uncertain, and we have now been assured, through the kindness of Dr. Signoret, that our belief that they were this species is correct.

Of the fourth species, *Eupelix marginata*, Fieber, from Bona (Kat. Cicad., 1872), I know nothing, and I am not aware that any description of it has been published.

1, St. Mildred's Terrace, Bromley Road,
Lee, S.E.: December, 1878.

DESCRIPTION OF A NEW SPECIES OF *CUCUJUS* FROM ASSAM, AND OF *CERATORRHINA GEMINA* FROM WEST AFRICA.

BY GEORGE LEWIS.

CUCUJUS IMPERIALIS.

Elongatus, depressus, niger, elytris atro-cyaneis. C. bicolori affinis, sed multo latior; antennis pedibusque robustioribus.

Long. 9½, *lat.* 2¼ *lin.*

Hab.: Sadia, Assam.

In general structure this species resembles the Indian *C. bicolor*, Smith, but it is broader, with thicker antennæ and legs: the sculpture of the thorax and the punctures of the elytra are both on a larger scale. In colour it agrees with *C. Mniszechi*, Fairm., from Japan, but the last is a more slender insect.

CERATORRHINA GEMINA, Lewis (*vide* Ent. M. Mag., xv, 198).

Parum convexa, aureo-viridis, elytris lætissime inauratis, maculâ humerali apicalique nigris, tarsis posterioribus pallide viridis.

Long. 13–16 *lin.*; *lat. elytrorum,* 5⅛–6⅛ *lin.*

Mas: vertice medio profunde emarginato, utrinque angulariter prominente, clypeo ad apicem in medio processu brevi, antennis valde dilatatis; pedibus gracilibus, tibiis omnibus extus edentatis, intermediis intus sinuatis; elytris sublævigatis.

Fem.: capite mutico, clypeo fortiter denseque punctato, anterius leviter emarginato: tibiis anterioribus extus tridentatis, intermediis posterioribusque uni-spinosis: elytris punctis seriatis magnis parum profundis, interstitiis parce punctatis.

Hab.: Isubu, West Africa.

This species is allied to *C. auratus*, Westwood, from which it differs in its narrower and rather more depressed form, its comparatively unicolorous upper surface being more golden in tinge, the finer sculpture of the wing-cases, and the paler colour of the tarsi. It will be observed from the diagnosis that there is considerable sexual discrepancy in the sculpture of the elytra, and this is also observable in *C. auratus*. In order, therefore, to appreciate the sculptural distinctions of the two species, individuals of the same sex should be compared.

3, Green Street, W.: *February* 13*th*, 1879.

Bagous diglyptus, Boh. (*a species new to the British list*), *at Burton-on-Trent.*—Two examples (♂ and ♀) of a *Bagous*, recently submitted to me for inspection by my friend, Mr. J. T. Harris, I find on examination to be *B. diglyptus*, Boh., a species not hitherto recorded as British. Superficially, not unlike *B. brevis*, Schön., *diglyptus* may be at once separated from that species by its proportionately shorter and broader form, the thorax not having three foveæ just before the apex, the much shorter tarsal joints, &c.; from *lutulosus*, Gyll., which it resembles in its very short stout tarsi, it may be known by its larger size, stouter limbs, the alternate interstices of the elytra less raised, &c.

The very short broad form, uniform grey colour, the head longitudinally impressed between the eyes, the rugulose thorax, which is much constricted before the apex, and having a short dorsal channel near the base, the alternate interstices of the elytra slightly widened and raised, with the usual callus on the 5th almost obsolete, the very short stout limbs, the tibiæ ferruginous, much curved inwardly and thickened above the middle, and the very short tarsi with the penultimate joint simple and not bilobed, readily distinguish this species from its allies.

M. Chas. Brisout de Barneville has corroborated this species for me, and remarks that it is still very rare on the continent. One example, taken by Mr. Harris from accumulated flood-refuse in his own garden on the banks of the Trent, at Burton, in April, 1872, and a second subsequently found by Mrs. Harris crawling on a wall near the same spot.—Geo. C. Champion, 274, Walworth Road, London, S.E.: *January 21st*, 1879.

Synonymic notes on some British Hemiptera.—In Dr. Puton's recently published "Synopsis des Hémiptères-Hétéroptères de France" (*vide* p. 94, *ante*), there are some points which, having reference to British species, deserve our special attention.

Nysius maculatus, Fieb., is reckoned to be only a variety of *N. thymi*, Wolff, but Dr. Puton says he has not Fieber's types.

Nysius brunneus, Fieb., is referred to *N. helveticus*, H.-Schf., as a variety; and *N. obsoletus* Fieb., and *N. ericæ*, Boh., are put as synonyms of *helveticus*.

Kleidocerus, Westw., is substituted for *Ischnorhynchus*, Fieb., but I cannot find that Westwood ever characterized a genus under that name. In Stephens's "Catalogue of British Insects," ii, 342 (1829), the name first appeared as "*Kleidocerys*, Westw., MSS.," and in his "Introduction to the Modern Classification of Insects," ii, Synops. 123 (1840), Westwood puts it as a synonym of *Cymus*, Hahn; being, therefore, merely a name, it cannot supersede *Ischnorhynchus*, which is a genus duly defined by Fieber.

The species *resedæ*, Panz. (F. G., 40, 20), is made to give way to *didymus*, Zett. (Act. Holm., 1819), but, according to Hagen, Panzer's description and figure were published in 1797, and his name must, therefore, be adopted.

Heterogaster, Schill., was superseded by *Phygadicus*, Fieb. (Eur. Hem., 201), expressly on account of the previous employment of the name in *Coleoptera* by Dejean.

Stygnus, Fieb. The name having been already used by Laporte in *Arachnida*, was altered to Stygnocoris in Brit. Hem., p. 213.

Pachymerus. When, in 1875 (Ent. Mo. Mag., xi, 185), I repeated what had *been already said by others*, that the names Pachymerus, Le Pel. et Serv., and

Acalypta, Westw., were not tenable in *Hemiptera,* on account of previous occupation in *Coleoptera,* the former having indeed been expressly rescinded by Amyot and Serville for this very reason (Hém., p. 253), the late Prof. Stål wrote to me that, nevertheless, he did not see any reason for not using the names in *Hemiptera,* and that any law to the contrary must be abrogated. I had too much respect for Stål to continue the argument, but, considering the utter confusion that must prevail if the principle of *double emploie* were tolerated, and the tendency now shown to action in this direction, I think it right again to draw attention to the subject.

Beosus, Am. et Serv., is made to include Ischnotarsus, Fieb. (1861) = Dieuches, A. Dohrn (1860). Fieber, however, expressly separated his genus (which includes our species *luscus,* Fab.) from that of Am. et Serv., putting three other genera between them. Dr. A. Dohrn had previously distinguished and separated his equivalent genus.

Scolopostethus decoratus, Hahn, = *ericetorum,* Leth., *melanocerus,* Thoms.

I have already (E. M. M., xiv, 13) given reasons for believing that this determination is not correct. Hahn (Wanz., i, 139) says of his *decoratus*—" Fühler schwarzbraun, das erste Glied derselben am Ende und das zweite am Grunde röthlich gelbe," and the figure (pl. xxii, f. 71) so represents them. But these are not the characters of *S. ericetorum,* Leth., in which the antennæ have the 2nd joint only pale at the extreme base, all the joints, with this exception, being black. Therefore, Lethierry's name should stand.—J. W. Douglas, 8, Beaufort Gardens, Lewisham: *January* 13*th,* 1879.

Note on Halictus puncticollis, &c.—Since writing the description of *Hymenoptera* that appeared in the last No. of this Magazine, I had occasion to refer to a paper by Morawitz on some new bees from Germany, which was published in the Verhandlungen des zool.-bot. Vereins in Wien, vol. xxii, and there, at page 370, I came across the description of an *Halictus puncticollis* which agrees in every particular, so far as I can judge, with the species I have just described; it is strange we should have both selected the same name for the same insect. The species will have to stand in our lists as *puncticollis,* Mor., Verh. zool.-bot. Wien, xxii, p. 370. It is possible also that *longiceps* may prove to be his *porcus,* but here the description does not quite agree, so I must wait for further evidence.—E. Saunders, Upper Tooting: *February,* 1879.

Note on Halictus puncticollis.—This insect is probably common here, as Mr. Saunders, on looking at my specimens of *Halicti,* picked out seven specimens (4 ♂ and 3 ♀) which had been supposed to be *H. villosulus.*—E. N. Bloomfield, Guestling: *February* 10*th,* 1879.

Occurrence in Britain of Nonagria sparganii, Esper.—At the Meeting of the Scientific Committee of the Royal Horticultural Society, held on the 14th January, Mr. Sydney Webb exhibited a ♂ of a species of *Noctuidæ* new to our Fauna, which he had determined as above. He had bred it from a larva (one of many) feeding in the stems of *Iris pseudacorus* in Surrey. It is closely allied to *N. typhæ,* and, on the continent, is almost as common and as widely distributed as is that species, being priced at under sixpence by the continental dealers. The only wonder is that it has not been previously detected here. It usually feeds in *Typha,* so that its food plant here (so far as is at present known) is new.—Eds.

On the power of resisting intense cold possessed by Cheimatobia brumata.—As regards the power of *Cheimatobia brumata* to resist intense cold, it may be interesting to record what came under my observation on the 21st December last, during a frost of no common severity, and with the earth, on this high land, covered with snow.

While searching for ivy for Christmas decorations, a *C. brumata* was found at rest up an oak tree, from which some ivy had been drawn. The moth was touched with a stick and flew on the snow; far from being in a "frozen" state, it clung, when picked up, to my daughter's hand, with its wings closed, and, while we were remarking upon its condition in such severe weather, it crawled to the side of the hand and again flew off about a yard, settling on the snow, upon which it walked. The insect was by no means a fresh one, but had doubtless emerged, before the frost began, early in December.—E. S. HUTCHINSON, Grantsfield, Leominster: *February 3rd*, 1879.

Tineina taken and bred in 1878.—April 20th—one *Gelechia junctella*, beaten from willow, at Witherslack. April 24th—larvæ of a *Gelechia*, found at Lytham, roughly described as follows: " dark grey, red spots, feeding in sand-cocoons at roots of *Cerastium* and *Stellaria*, produced (July 6th) a little *Gelechia* which Mr. Stainton pronounces to be new, and allied to *Knaggsiella*, unless it be a very unusual specimen of *maculiferella*." More must be bred before naming. April 29th—*Micropteryx Sparmannella* and *salopiella* at Witherslack, flying in the afternoon sun. April 30th—a larva of *Diplodoma marginepunctella* at Witherslack, fed on larvæ of *Solenobia triquetrella*, and emerged June 20th; the *triquetrella* all emerge females, and are very plentiful. July 6th—larvæ of *Dep. capreolella* in *Pimpinella saxifraga*, not in radical leaves, but high up the stem, green, black head, all sent to Mr. Sang. July 6th—larvæ of *Nepticula betulicola* in small contorted galleries in birch, filled with brown excrement, larvæ bright yellow, produced August 15th. July 24th—larvæ in cones on birch, green and horny looking, produced five imagos of *Gracilaria populetorum* from July 28th to August 1st. August 19th—cones on *Polygonum hydropiper* found on this date produced *Gracilaria phasianipennella* from September 1st to 10th; this and *G. populetorum* are very much infested with ichneumons. August 19th—a pupa spun up in the hollow of a blade of *Carex*, and covered all over with a thick white web, is expected to produce the long hoped for *Elachista serricornis*. August 19th—I think that this will be the date when I saw plenty of imagos of *Glyphipteryx schœnicolella* flying over cotton grass on the wet moss at Witherslack, but being mistaken for *Fischeriella*, not many were taken, and no date was recorded. August to October—many larvæ of an *Elachista*, supposed to be *ochreella*, were found in a long stiff grass, plentiful at Witherslack on the wet mosses, described as blackish, reddish-brown head, and generally mining up and across. September 7th to October—larvæ of *Elachista tæniatella* found in plenty in *Brachypodium sylvaticum* at Grange. October 5th—plenty of larvæ of *Nepticula æneofasciella* in blotches in leaves of agrimony at Grange, larva yellow: can no one send me larvæ of *agrimoniæ* in exchange for these? October 5th—after great difficulty, I found on this day a few larvæ mining in *Festuca ovina*, described as slaty-brown, which are no doubt those of *Elachista dispunctella*. This confirms what I formerly said about the insect, that it would be an autumnal feeder, would hibernate in old grass stems, and change late in spring. In June, 1876, a larva was found and described as greyish-yellow, which produced *imago July 8th, 1876.*—J. H. THRELFALL, Preston: February 3rd, 1879.

Capture of Semasia gallicolana.—On the 19th May, 1878, we had a tremendously high wind. Entomologists, as a rule, do not like wind, but this wind produced me two specimens of *Semasia gallicolana*, an insect I had never taken before. The moths were blown off the oak trees and took refuge on some palings, where they were easily boxed.

I have placed them by the side of my solitary specimen of Stephens' *Pseudotomia obscurana*, described by him, in 1834, in the 4th volume of his Illustrations, Haustellata, p. 98, and at present I am disposed to consider the two species distinct, though it is quite possible that, if I had a longer series of both, my views might be modified.

Gallicolana is a very bright gay-looking insect, whereas *obscurana* is well-named, it is dull and *obscure*, the pale dorsal blotch being almost entirely suffused.

I cannot easily imagine any one confounding *obscurana* with *argyrana*, whilst the resemblance between *gallicolana* and *argyrana* is very striking. Heinemann particularly notes the similarity of the two species, in his description of *Grapholitha gallicolana* (p. 200). Nearly 50 pages earlier, he has a *Grapholitha obscurana* (p. 153), which he takes for Herrich-Schäffer's *obscurana*, fig. 307 (though objecting to the form of the wing in the figure), but he says the basal edge of the dorsal spot is *vertical*, which would never do for *our obscurana*.

Zeller, who described *gallicolana* in the Isis of 1846, p. 255, lays stress on *an elongate dark blotch along the anterior edge of the underside of the hind wings.* I do not perceive this character in my *obscurana*.

My specimen of *Semasia obscurana* was beaten from hedges at Lewisham, June 6th, 1848.

The *Semasia obscurana* of the Manual II, 241, is *gallicolana*—in that error I followed Wilkinson's "British Tortrices."—H. T. Stainton, Mountsfield, Lewisham: *February 10th*, 1879.

Occurrence of Tinea fenestratella (Heyden) in Britain.—I have pleasure in adding another species to the list of British *Tineæ* by recording the occurrence at Chatteris, Cambridgeshire, of *Tinea fenestratella* (Heyden), a species hitherto, I believe, unobserved in Britain, though it was discovered in Germany, as far back as 1843, by Carl von Heyden. To Mr. Stainton I am indebted for kindly determining the species; he detected it amongst a few *Tineæ* submitted to him for examination last January. The following description of the insect is given in the Entomologists' Annual for 1868, p. 8, in the article, "In Memoriam, Carl von Heyden" (and which description is translated from the Stettin. entomologische Zeitung, 1863, p. 342):—

"Al. exp., 4 lin.

"Anterior wings rather shining, yellowish-grey, mixed with darker scales. In
"the middle of the wing is an oval, whitish, almost transparent spot, and beyond
"this, towards the apex of the wing, two opposite spots more indistinct, yellowish,
"and elongate. The cilia are dark, with a blackish divisional line. On the grey
"underside only the transparent centre spot is perceptible. Posterior wings pale grey,
"with the apex and cilia darker. Head clothed with reddish-brown hairs, darker on
"the crown. Labial palpi with drooping, narrower terminal joint, brown. Antennæ
"rather shorter than the anterior wings, thin, brown. Thorax and abdomen brownish.
"Legs yellowish; the tarsi blackish above. It has the appearance of a small *Tinea*
"*imella, Hb.*, with very narrow anterior wings."

Carl von Heyden also adds, that the one specimen he then possessed (1843) was bred from dry wood early in June. Heinemann says "the larvæ in rotten alder wood," I have no doubt, however, that those I had the good fortune to obtain (5 in number) were bred from stumps of elm trees which had been placed, twelve or fifteen years ago, in the garden in which the insects were taken, and are now very rotten and decayed. I am not aware of the existence of any alder near the locality. The first specimen was taken, at rest, in an outhouse in the garden on 24th June, 1877, the other four the following evening, on the wing shortly before sunset. The facts of my ignorance of the species I had taken, and of my seldom collecting or being in the garden where they occurred, will doubtless account for the small number of specimens seen.—HAROLD RUSTON, Ealing, Middlesex: *February 6th*, 1879.

Economy of Lithocolletis scopariella.—On the 27th June, 1878, Mr. Sang was searching amongst some broom, at Darlington, for specimens of *L. scopariella.* Whilst so engaged, his attention was attracted by a *Lithocolletis* struggling to escape from its pupa-case, where it was held fast by one of its legs.

The pupa-case partially protruding from *the inflated mine along the broom twig,* revealed where had been the feeding place of the larva!

In April, 1856, I had made the acquaintance of the larva of *Lithocolletis quinquenotella,* which had been sent to me by Herr Anton Schmid, of Frankfort-on-the-Maine, and when I noticed how it made bladdery inflations along the stems of *Genista sagittalis,* it did occur to me that *L. scopariella* might have a similar habit on broom. Since then I had bred, what appears to me identical with *L. scopariella,* from larvæ mining the small *leaves* of *Calycotome spinosa* in the south of France, and thenceforth my attention had been directed more to the leaves than to the stems of the broom.

I am, therefore, particularly pleased that Mr. Sang's fortunate discovery has again put us on the right scent.—H. T. STAINTON, Mountsfield, Lewisham: *6th February*, 1879.

A Nepticula new to Britain.—I sent, a short time ago, some *Nepticulæ,* which appeared strange, to Mr. Stainton for identification, and he has just returned them as *lapponica,* Wocke. They are closely allied to *N. sorbi,* but "have the fascia less oblique, more yellow, and generally broader." The larvæ feed in broad serpentine mines in birch, are light in colour when full fed, and are to be found at the same time as *N. betulicola,* viz., October 1st to 20th.—J. H. THRELFALL, Preston: *18th February*, 1879.

Helicopsyche bred in England.—Thirty-six years ago, R. J. Shuttleworth, of Berne, discovered the true nature of certain little heliciform cases that have several times been described as shells of fresh water *Mollusca.* He rightly asserted that they were the cases of caddis-worms; in this he was confirmed, some thirteen years ago, by a North American species having been bred. But, until now, all attempts to breed the insects from the European forms had been without success. At last the mystery is solved, for Prof. de Rougemont, of Neuchâtel, has reared the insect from cases found at Amalfi, near Naples, and a preliminary account of it is given by him in Carus's "Zoologischer Anzeiger" for Dec. 30th, 1878, p. 393. In my "Revision and Synopsis of the *Trichoptera* of the European Fauna," part v, p. 269, I described a little insect as *Helicopsyche* (?) *sperata,* from Naples, that I thought might represent the long-desiderated imago of *Helicopsyche.* My description and figures were necessarily incomplete, for I had only seen a single specimen, and that was nearly destroyed by an accident. From information with which Prof. de Rougemont has favoured me, it appears certain that it really was *Helicopsyche,* and probably of the same species as that now bred by him; but he has not yet quite completed his observations, and I have at present not seen his insect, although he has had the kindness to send me drawings of the neuration, &c.

I think the opinion, several times published by me, that the "*Helicopsyche*-cases" now known from nearly all quarters of the globe, might prove to be the work of more than one genus of insects, will prove correct. The European insect is perhaps not quite congeneric with that bred in North America, and it may be that the latter should take the name *Thelidomus*, employed by Swainson in 1840 for American cases, under the idea that they were shells.

I may add, that I possess a not yet fully examined insect from Saxony that probably will prove to be a *Helicopsyche*, and if so, I see no reason why we may not detect this remarkable form in the dribbling springs of some part of the south of England or south-west of Ireland.—R. McLachlan, Lewisham : *Feb.* 19*th*, 1878.

British Collectors.—We want, besides the excellent papers descriptive of new exotic species which have too exclusively filled our pages, records of observations on habits, life-histories, and geographical distribution of insects; on local variation, its causes and results; narratives of entomological excursions and captures; observations on structure, functions, and instinct; relations of insects to flowers; and, in short, on all such subjects as are interesting to the greater number, as distinguished from descriptive papers which are interesting only to the lesser number. In saying this, I am fully aware of the difficulties that lie in the way of obtaining these good things. Our Secretaries and Council would be very glad to get fairly well-written and original papers on any of these subjects, but they do not come. The reason of this, no doubt, lies in a state of things which has often been lamented: namely, the too-exclusive devotion of our native entomologists to the formation of purely British collections. The exhaustion of our limited insular fauna, and the extreme unlikelihood of the discovery of new species, seem to teach no lesson to the purely British collector, and he goes on collecting, observing, and recording what has been collected, observed, and recorded over and over again. Some, it is satisfactory to notice, break through the artificial limits imposed by the majority, and extend the range of their excursions and observation to the continent. The ice once broken this way, a boundless field of interesting study lies before them; for, by exchange and a trifling outlay of pocket-money, large collections can be formed and the mind expanded by the study of the whole Palæarctic Fauna, of which that of the British Isles is only a half-starved fragment. Even if it were only for the pleasure of tracing the wonderful local variations, the formation of sub-races and races of our common English insects, some of them of surprising beauty, over the wider continental area, one would think that every intelligent entomologist with us would be eager thus to extend his studies. And it could be done with no more expenditure of time and very little more* of money than the present exclusive pursuit of home productions. Many, of course, would plead that they collect insects only for pure amusement, caring nothing for science. To such we have nothing further to say. But we believe and hope that there are very many British collectors and observers of insects who are able and willing to take a higher view of their pursuit, and if we could only induce a sufficient number of these to take a more general interest in the study, to write papers for us, and join us, the reciprocal good effect which we aim at, viz., the enlargement and improvement of our "Transactions," and thereby the further increase of members and means, would be produced, thus, as we hope, elevating the status of entomology in this country.—*Extracted from the Address of the late President of the Entomological Society of London, on the* 15*th January*, 1879.

Obituary.

Frederick Smith died on the morning of the 16th of February, after a surgical operation, at the age of 73. For the moment we make simply the foregoing announcement; an extended notice will appear in our next No.

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* Very much less, in the majority of cases.—Eds.

NATURAL HISTORY OF *LYCÆNA MEDON*, HUF. ? (*AGESTIS*, OCHS.).

BY WILLIAM BUCKLER.

When Professor Zeller, in 1867, published his most interesting history of this species at pp. 73–77, vol. iv, of this magazine, he stated it to be generally accepted that *Lycæna Artaxerxes* is only a variety of *Medon*; and yet it appeared to him extremely improbable that the larva of *Medon* should habituate itself to the food-plant of *Artaxerxes*.

Since then I am not aware of any record of experiments made in accordance with Zeller's suggestion, which induces me to offer the following evidence in proof that the larva of *Medon* really does nourish itself on the same species of food-plant in England as in Scotland.

But, first in order of time, I have to mention that on June 3rd, 1877, Mr. J. E. Robson, of Hartlepool, while searching *Helianthemum vulgare* growing near the coast in his locality, found five larvæ of a *Lycæna*, and at once very kindly forwarded them to me; on comparing them with the figures I had taken of larvæ of *Artaxerxes* in 1868, I found them to be in every respect precisely alike. These larvæ soon fed up on *Helianthemum*, protected by a glass cylinder, and they duly changed to pupæ, two of them, unfortunately, were attacked with mould, but the other three disclosed three differently marked butterflies, viz.: on July 2nd, 5th, and 7th, these appeared respectively to be *Salmacis*, *Artaxerxes*, and *Agestis* above, but to partake most of *Salmacis* beneath.

After this result, I became more than ever desirous of seeing larvæ of the typical *Agestis* from the southern downs, and it was not many weeks before Mr. Wm. R. Jeffrey most kindly put me in the way of making their acquaintance from the egg onwards, by his capturing several typical females as they were flying over and alighting upon *Helianthemum vulgare*, on a Kentish chalk down. They readily deposited their eggs on sprays of the plant, and I had the pleasure to receive a share of them from my friend on 13th of September, when I found them all laid on the under-sides of the leaves to which they firmly adhered, singly, and in little groups of twos, threes, and more together.

The egg is smaller than that of *Ægon*, though very like it in form and sculpture, being circular, flattened, with a central depression on the upper surface, the shell covered with a coarse, prominent reticulation, gradually becoming finer towards the nearly smooth depression; its colour, a pale greenish-drab, continues to the last. A hole in the shell betrays the escape of the larva, which is a very sluggish little creature, not inclined to leave the under-side of the leaf where it is hatched, even when the leaf has become dry; indeed, all the leaves on which the eggs were laid had curled and shrivelled so much when the larvæ were hatched, as to make their detection and rescue while alive rather difficult.

I observed the first three larvæ on 19th of September, one of them already dead, and on the 22nd, eighteen more, with some of them apparently dead or dying.

A month previously I was provided with a very large pot of turf cut from a chalk hill, and amongst grasses, *Leguminosæ*, and other low plants, some fine shoots of *Helianthemum vulgare* were also growing; on these last the young larvæ were placed; next morning, about half of them lay dead, and the others had disappeared. But after a day or two I began to detect signs of the survivors, by small flesh-coloured spots appearing on the upper dark green surface of a few of the leaves, these spots gradually increased in size to blotches of irregular figure, and turned of a rusty pale brown colour; when seen from beneath against the light, they appeared semi-transparent and colourless, and sometimes then the tiny larva appeared as a dark object against the luminous blotch. By the 20th October, a few leaves had their lower cuticle almost entirely eaten away, and their upper surface turned brown, but so slow was the growth of the larvæ, they had only attained one line in length by the 3rd of November, and though they fed a little at intervals, and crept from one part of their food to another to the end of the month, yet they were never seen on any of the other plants around them, but only on the under surface of the leaves of *Helianthemum*, where they became eventually fixed for hibernation.

The pot containing the larvæ and the various plants was kept entirely uncovered inside a window of western aspect; the grasses were much grown by the 7th of March, 1878, when I could only see two larvæ on a new shoot of their food, and on the 14th only one, whereupon I began to cut down the grass, a blade at a time, carefully, so as to lay bare the few new scattered shoots of *Helianthemum*, which were from one, to two, or three inches above ground, and very near the margin of the pot; on the 21st, the second larva was again visible on a little shoot close to the earth, and two more larvæ, less advanced, on other small shoots, were seen on April 14th.

Here it will be proper to state the fact, that after hibernation, *neither of the* larvæ fed at all on any of the mature sprays of the plant, *which seemed* apparently healthy and vigorous, but pertinaciously sought the young tender shoots, eating a portion from under a leaf, then a little from another leaf, or moved away entirely, creeping over the ground and through all impeding growths, until, with unerring instinct, another shoot, sooner or later, was reached : thus, was I continually losing sight of one or more of the larvæ, often for days together, but only to find them again by aid of new blotches appearing to betray them.

Towards the end of April, they ravaged so recklessly the small stock of their food remaining in the pot, never staying to clear the whole under-side of a leaf, but changing their quarters so often, that I began to fear they would desert the pot and escape altogether ; for at that time I was unable to obtain a fresh supply of their food, and, to make sure of completing my observations of the larva when full grown, I confined the two largest individuals in a bottle, and supplied them with cut portions of their food, on which they throve, and therein attained their full growth of barely half an inch, and on the 15th of May one fixed itself for pupation by a cincture across the back of the fourth segment, on a bit of linen, the second followed in the same way on the 16th, and on the 21st and 24th they changed to pupæ. The two remaining larvæ soon after fixed themselves, but died unchanged, probably the effect of insufficient food.

The newly-hatched larva is very minute, with a glistening blackish head, stoutish body, of light drab-green colour, velvety, and hairy; its size is doubled in eight days ; and when a month old, it is of the usual *Lycæna*-shape, one line in length, thick in proportion, with small retractile head, the body of a dull pinkish-brown colour, with darker dorsal stripe, and rather hairy.

On waking up in spring, it is of a dingy slaty-green colour, and early in March it moults, when the old skin is left attached to the plant like an empty shell, not in the least shrivelled, but split open laterally along the ridge above the legs ; the larva now becomes quite pale green on the back, broadly pinkish along the lateral ridge, and still hairy. Early in April it is nearly an eighth of an inch long, of greenish-flesh colour, palest on the second segment and dorsal eminences, pinkish in the dorsal hollow, and also along beneath the spiracular region, the long whitish hairs closely resembling those on the food plant.

The last moult occurs about the 21st of April, when it is three-sixteenths of an inch long, and attains its full-growth of barely half an inch early in May ; during this interval, of all its characteristic *details, which have been* published as *Artaxerxes* (*vide* vol. v, p. 176), I have only to say in addition of these typical larvæ, that the green is more lively and full, and the pink along the lateral region is darker, inclining to purplish.

It only remains for me to state that my experiments have proved to me the truth of what Zeller long ago suspected, and since then Newman and others have believed, that *Artaxerxes*, *Salmacis*, and *Medon* (*Agestis*), are but one species.

Emsworth: *February 4th*, 1879.

DESCRIPTION OF A NEW SPECIES OF *HETÆRINA* FROM COSTA RICA.

BY R. McLACHLAN, F.R.S., &c.

HETÆRINA MAXIMA.

♀ immature. Bronzy-brown. Head black above; the base of antennæ yellow: front green, clothed with blackish hairs: nasus metallic-blue, green at its base: labrum chalybeous. Thorax apparently with a yellow median carina and four yellow lines on either side (damaged). Legs blackish, distinctly yellowish internally. Abdomen bronzy; without markings.

Wings hyaline, slightly tinged, *no pterostigma*: the base of the wing (especially in the anterior) *occupied by a very dense reddish network* (as is usual in the ♂ of *Hetærina*), giving the wings the appearance of being reddish at that part. 27 ante-cubital, and 32 post-cubital nervules in the anterior-wings.

Length of abdomen, 38 mm. Length of posterior-wing, 40 mm. Expanse, 83 mm.

Mount Irazu, 6000–7000 ft. (Rogers).

It is much to be regretted that only the ♀ (and that immature) of this species has been received. No known species has, in this sex, the same dense reticulation at the base of the wing (the nearest approach to it being found in *H. basalis*), and it appears to me possible that the adult ♀ may have the base of the wings red, as is usual in the ♂ of nearly all the species. It is the largest yet known, the size being only occasionally attained by the ♂ of the anomalous *H. Borchgravi.*

This insect was received by Messrs. Godman and Salvin from Mr. Rogers, their collector. I believe it to represent the ♀ of an undescribed species allied to *H. basalis*, or rather to the condition of that species known as *H. californica.*

With the exception of *H. cruentata* which occurs, in the collection sent by Mr. Rogers, in great numbers, the only other *Hetærina* from the same locality is apparently a form of *H. majuscula*, but the general aspect of *H. maxima* precludes the probability of the type being a dimorphic condition of that species; the colour of the legs, and other characters, point to a connection with *basalis* and *californica.*

Lewisham, London: 1878.

INTRODUCTORY PAPERS ON FOSSIL ENTOMOLOGY.

BY HERBERT GOSS, F.L.S., F.G.S.

No. 6.

Mesozoic Time.

[*On the Insecta of the Triassic Period, and the animals and plants with which they were correlated.*]

With the Triassic Period we enter on a new era in Geological history, which is marked by the predominance of reptilian[*] life, and the first appearance of mammals, and, *probably*, of birds.

No insects have yet been discovered in the Triassic rocks[†] of the United Kingdom, and although on the continent of Europe the Trias is largely developed, especially in Germany, only seven species have been recorded from it.

Of these seven species three belong to the *Neuroptera*, one to the *Orthoptera*, and three to the *Coleoptera*.

Two of the *Neuroptera* were discovered by Herr C. Zinken,[‡] in the Bunter-Sandstein[§] of Gödewitz, near Salzmunde, and have both been referred to the family *Sialidæ* by Professor Heer, who has placed them in an extinct genus—*Chauliodites*—and named them *Chauliodites Picteti* and *C. Zinkeni* respectively. A third specimen, recently obtained from the Keuper, has also been referred by Dr. Heer[‖] to the same genus, and has been named by him *Chauliodites helveticus.*

The only known specimen of *Orthoptera*[¶] from the Trias was obtained from the Bunter-Sandstein of Trebitz. It belongs to the family *Blattidæ*, and has been described by Dr. Heer, who placed it in an extinct genus—*Legnophora*—and named it *Girardi*, after Professor Girard, of Halle, in whose collection he discovered it.

The three species of *Coleoptera* were obtained from the Keuper of Vadutz, and have been severally named by Dr. Heer *Glaphyroptera Pterophylli*, *Curculionites prodromus*,[**] and *Chrysomelites Rothenbachi.*[††]

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[*] The whole of the Secondary or Mesozoic Period is frequently spoken of as "the age of reptiles."

[†] So few insects have been discovered in the rocks of this period, that it may seem unnecessary to have devoted a separate paper to their consideration; but, for the sake of preserving uniformity of plan in this series of papers, I have thought it desirable to do so.

[‡] Vierteljahrsschrift der naturforschenden Gesellschaft in Zürich (note on p. 279), 1864.

[§] The Trias, as its name implies, is divided into three distinct formations, which in Germany are respectively named the Keuper, the Muschelkalk, and the Bunter-Sandstein.

[‖] Flora Fossilis Helveticæ, p. 77. Taf. xxix, 1877; and Heer, *in litt.*

[¶] Vierteljahrsschrift naturf. Gesellsch. Zurich, *antea cit.*, pp. 297, 298.

[**] "Le Monde primitif de la Suisse," p. 99: and Neuer Denkschriften der schweiz. naturforsch. Gesellsch., xiii, 1853. Taf. vii.

[††] *Flora Fossilis Helveticæ*, p. 76. Taf. viii (Heer, *in* litt.)

From the Trias of North America one species of *Coleoptera* has been recorded by Mr. Scudder,[*] who also states that certain questionable tracks in the rocks of the Connecticut Valley have been referred by Prof. Hitchcock to *Insecta* and *Myriopoda.*

Prof. Dana[†] has figured a fossil larva of a Neuropterous insect, obtained from Turner's Falls, Connecticut Valley, which is believed by Dr. Le Conte to have been related to the genus *Ephemera* ; Dana also alludes to the tracks in the rocks before mentioned, which he supposes to have been made by the larvæ of insects, and by *Crustacea.*

The *Arthropoda*[‡] of this period include, in addition to Insecta, as we have seen, *Myriopoda* (possibly) and *Crustacea*, the latter being chiefly represented by *Ostracoda.*

The *Mollusca* are exceedingly abundant, and include, in addition to a number of genera characteristic of the period, several Palæozoic types.

The *Vertebrata* are represented by animals of almost all the existing classes.[§] The fishes are principally Ganoids; and the Amphibians belong exclusively to the gigantic *Labyrinthodontia*, which, at the close of this period, disappear altogether.

The reptiles comprise living as well as extinct Orders, the former including *Crocodilia*, *Lacertilia*, and *Chelonia*,[||] and the latter *Plesiosauria*, and *Deinosauria.*

Although no remains of birds have been discovered in rocks of this age, numerous foot-prints in the Triassic strata of the Connecticut Valley are confidently believed by many geologists[¶] to have been made by animals of this class.

The Mammals are represented by two small forms, both referred to extinct genera of Insectivorous Marsupials.

The Flora of the Period, although decidedly Mesozoic, included some Palæozoic types.

The dominant forms were *Equiseta*, Ferns, Cycads, and Conifers; but no remains of true Grasses, Palms, or Angiosperms have been discovered.

The Avenue, Surbiton Hill, S.W.:
1*st March*, 1879.

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[*] Geol. Mag., vol. v, May, 1868 (neither the genus nor the family to which the insect belonged is mentioned).

[†] "Manual of Geology," *antea cit.*, pp. 410, 411.

[‡] In this and the remaining papers of the series I do not propose to refer to animals belonging to any sub-kingdom lower in the scale than the *Arthropoda.*

[§] *Pisces*, *Amphibia*, *Reptilia*, *Aves*, and *Mammalia.*

[||] This Order is only known at this Period by more or less doubtful footprints.

[¶] *Hitchcock*, in Mem. of Amer. Acad. (new series), vol. iii, p. 129, 1848; and Dana. in *"Manual of Geology," antea cit.*, p. 411.

NOTES ON BRITISH *TORTRICES.*

BY C. G. BARRETT.

(*Continued from page* 149).

Spilonota rosæcolana, Dbld. There is special interest attaching to this species on account of its being either very scarce or not recognised on the continent. In Dr. Wocke's list it is only included with a query as to whether it is a variety of *suffusana*, and Prof. Zeller only recognised its distinctness on receiving a series from me a few years ago. In this country it has been known for nearly thirty years—having been described by Mr. Doubleday in 1850—but I think that no information respecting its larva has ever been published, and the only note on its earlier stages that has reached me is an observation by my friend, Mr. Machin: "larva feeding in June in shoots of rose."

Therefore, I was gratified at finding, in the summer of 1876, that the moth was rather common in a small hedge of sweet-briar in the garden, and appeared to be so especially attached to the sweet-briar that the neighbouring roses hardly furnished a specimen. It was sluggish and difficult to disturb in the day-time, but more lively towards dusk, and flying actively after dark. Early in the succeeding summer I found larvæ feeding in the young shoots of the sweet-briar, of which the following is a description:—

Thick, fat, rather wrinkled, somewhat cylindrical, but tapering at each extremity. Head brown, dorsal plate black, anal plate brown, body having the whole dorsal surface purplish-brown down to the spiracles, but the ventral surface whitish, thus leaving a curious resemblance to an infant *Cossus* larva. Very sluggish, living in the young growing shoots of sweet-briar (*Rosa rubiginosa*), drawing together the leaves and eating out the heart, often boring down into the shoot if it is succulent, but moving readily to a fresh shoot, and leaving it when full grown to assume the pupa state among rubbish. Feeding through May and until the middle of June. Pupa light brown. Imago emerging from June 29th to the end of July. Feeding also—but less commonly—on other roses, both wild and cultivated.

For comparison, it may be interesting to give descriptions of the larvæ of the allied species, all of which have been noticed before.

Spilonota roborana, Tr. Larva very short and obese, tapering almost from the *middle* to the extremities. Head small, light brown, dorsal plate black, anal plate very small, black also, body entirely shining brown or liver-coloured, semi-transparent, with the intestinal *canal visible.* Very sluggish, living in young shoots of Rosa canina, *R. spinosissima*, and other roses, drawing and twisting the leaves tightly together, and eating out the heart. In gardens it is a great nuisance, eating out the inside of the young flower-buds directly they appear. It is rather later than *rosæcolana*, feeding through June. When full-fed it leaves the shoot or bud to spin up among leaves or rubbish, where it becomes a light brown pupa. The moth emerges from the middle of July. It is rather variable, apparently influenced by *food*, since specimens reared on *Rosa spinosissima*, besides being small, are generally more or less suffused with rosy or grey.

Spilonota trimaculana, Haw. (*suffusana*, Z.). Larva very short and obese, tapering from near the middle. When half grown dark liver-coloured, with short, transparent, glistening hairs, and shining black head and plates. When full grown paler in colour, and tinged with greenish-brown, sometimes yellowish beneath, head light brown, dorsal plate black, anal plate yellowish. In young shoots of hawthorn, drawing the leaves slightly together and eating out the heart. Rather difficult to find, as it generally chooses a strong terminal shoot rather high on the hedge, and does not greatly *distort* it, but merely checks its growth. Moving readily from shoot to shoot, but leaving them when full-fed to spin up among rubbish, where it becomes a light brown pupa. I found well-grown larvæ from April 27th to the middle of May. The first moth emerged on June 3rd.

Spilonota incarnatana, Hb. (*amœnana*, Hb.). I have searched for the larva of this species in its locality the last two seasons, without success (the larvæ found all producing *roborana*), and have been disappointed of the opportunity of describing it, but Mr. Hodgkinson tells me that he rears it from larvæ which are not distinguishable from those of *roborana*, feeding on *Rosa spinosissima*, in Lancashire. This agrees with Dr. Hofmann's description from Treitschke: "Very similar to *roborana*, but smaller, pupa light brown with darker wing-cases." According to Ottmar Hofmann, it feeds also on *Rosa canina* and *birch*. If correct, this must refer to the large inland variety which is found occasionally in Epping Forest and other southern localities.

While, therefore, the larvæ of these last three species are so much alike as to be barely distinguishable, that of *rosæcolana* differs from them strikingly in form as well as in colour, a distinction the more interesting as it accompanies a striking difference in shape in the fore-wings of the perfect insect.

Notocelia Udmanniana, L. The larva of this species is very well known, and has several times been described, and I only mention it to point out—as Mr. Doubleday did to me six years ago—its close resemblance to that of *Spilonota roborana*, and also to record what does not seem hitherto to have been noticed, that in the curious ball of leaves formed by the determined spinning of the larva, along with the vigorous growth of the bramble shoot, there is a chamber of considerable size completely stuffed with the closely packed excrement of the larva.

Pembroke: *12th March*, 1879.

NOTES ON THE BRITISH SPECIES OF THE GENUS *ODYNERUS*.

BY EDWARD SAUNDERS, F.L.S.

I have lately been examining our British species of this genus, with the assistance of Thomson's excellent "Hymenoptera Scandinaviæ," and I thought that the results I have come to might be useful to other British Hymenopterists. Our species of the genus may be easily divided into the three known sections, thus :—

I. Species without a raised transverse line at the base of the 1st segment of the body .... HOPLOPUS
II. Species with a raised transverse line at the base of 1st segment :—
  a. Apical joint of antennæ in ♂ recurved, basal joint of abdomen in both sexes with long hairs......... ANCISTROCERUS
  b. Apical joint of antennæ in ♂ simple, basal joint of abdomen in both sexes naked .... SYMMORPHUS

In the first section (*Hoplopus*) are four species : *spinipes*, *melanocephalus*, *lævipes*, *reniformis*. Of these, *reniformis* is distinct by the long yellow spine on the intermediate coxæ of the ♂, and the yellow spot on the clypeus of the ♀ ; *lævipes* differs from the remaining two in having the intermediate femora of the ♂ simple, and the thorax in both sexes truncate in front, with the angles prominent; *spinipes* differs from *melanocephalus* in being larger, with yellower markings, and the pubescence on the head and thorax denser and darker, the ♀s are easily separated, as the clypeus in *melanocephalus* is nearly entire in front, whereas in *spinipes* it is deeply notched.

In the second section (*Ancistrocerus*) *basalis* has a red basal joint to the body ; *quadratus* may be separated off at once by the second segment of the body beneath being slightly raised towards the base, and then falling abruptly to the level of the transverse crenate sulcature ; *parietum* can next be distinguished by the second segment of the body, beneath, beyond the basal sulcature, being quite flat longitudinally, whereas in all the others it is more or less convex longitudinally, the costæ of the sulcature also are much shorter than in its allies. *Antilope* can then be separated off by the concavity of the metathorax above the insertion of the body, which is distinctly shining, whereas in the others it is quite dull. We are then left with 3-*marginatus*, 3-*fasciatus*, *parietinus*, and *pictus*. *Trifasciatus* may be known by its long thorax, the mesothorax being longer than wide across the tegulæ; 3-*marginatus* differs from the other two in having only three abdominal bands; finally, *parietinus* differs from *pictus* in having the 1st segment of the body narrower, and its band largely and suddenly dilated on the sides, while in *pictus* the bands are all linear.

The third section (*Symmorphus*) has three species: *crassicornis* may be known by its larger size, smooth and almost impunctate sides of the mesothorax; *gracilis* has many abdominal bands, the thorax truncate in front, and its angles mucronate; *sinuatus* has only three abdominal bands, the thorax rounded in front, and the angles not mucronate.

Mr. Bridgman first called my attention to *parietinus*, and remarks that there is a first-rate figure of it in Curtis's British Entomology; there is no doubt, I think, that all the species are good and distinct, they only want a little careful examination.

Holmesdale, Upper Tooting:
February 13*th*, 1879.

A NEW *EUDROMUS*, AND THREE NEW SPECIES OF *LEPTURIDÆ* FROM MADAGASCAR.

BY H. W. BATES, F.L.S.

In the few remarks I published in the January number of this magazine on the remarkable carabideous genus *Eudromus*, I alluded to the probability that more species yet remained to be discovered on the highlands of central Madagascar. It so happens that the next collection arriving in London from that island contained a strikingly distinct and beautiful new species of this genus, which I take this early opportunity of describing.

In the same small collection, and in a previous one of similar character, the extraordinary *Lepturidæ* of Madagascar were well represented; there being, besides *Sagridola maculosa* (Guér.) and *Logisticus rostratus* (C. O. Waterhouse), three new species of large size, one a new genus, the descriptions of which are here added.

EUDROMUS LUCIDIPENNIS.

Niger, politus, sub-opalescens: thorace sub-cordato, angulis posticis rotundatis, lævissimo, sulcis tribus modice impressis: elytris elongato-ovatis, humeris nullis, carina laterali valde elevata costisque utrinque quinque obsoletis, apice simplicibus: tarsis (♂) *omnibus subtus dense setosis.*
Long. 15 *lin.*, ♂.

Very distinct from the allied species by the polish of its surface, which appears as though varnished, and above has opalescent reflections. The elytra are destitute of humeral angles, which are more completely obliterated even than in *Eu. striatocollis.* The eyes are rather more prominent than in that species, and the posterior orbits less tumid. The thorax is sub-cordate, but much less sinuated and narrowed behind than in *Eu. striatocollis*; there is, however, a distinct sinuation in the sides, preceding the blunt and almost rounded hind angles; the surface has a long shallow groove (the prolongation of the basal fovea) on each side the dorsal furrow. The lateral carinæ of the elytra are so prominent, that the epipleuræ towards the base are almost vertical; they are also reflexed, making the sides of the elytral surface longitudinally concave; the interstices between the indistinct costæ are excessively smooth and glossy.

Madagascar: one example, ♂, for which I am indebted to Mr. George Lewis.

ANTHRIBOLA, *nov. gen.* (*Lepturidæ*).

Gen. Sagridolæ *affinis. Caput elongatum, ante oculos rostriforme, haud dilatatum: tubera antennifera haud elevata, fronte subplana; oculi ovati, haud emarginati, oblique positi, prominuli, subtilissime granulati. Antennæ corpore breviores* (♀?) *graciles, filiformes, mediâ fronte longe ante oculos inserti; articulo basali fere lineari quam* 2—4 *conjunctis longiori. Thorax subcampanuliformis, ut in Lepturis, sed dorso leviter bigibboso. Elytra trigona, ad suturæ apicem paullulum dehiscentia, apice sinuato-truncata, extus spinosa. Pedes sub-breves, robusti, femora intermedia et postica subtus acute dentata; tibiæ rectæ, tarsi haud elongati.*

A remarkable form, much resembling *Sagridola,* but differing in the elongated parallel rostrum and slender antennæ, with elongated scape, &c.

S. DECORATUS.

Supra ochraceo-pubescens, capite thoraceque supra vittis duabus, elytris fascia sub-basali maculari, alteraque postmediana utroque disco postice dilatata, humeris et marginibus nigris; epipleuris nudis nitidis, testaceo-fulvis; pedibus antennisque nigris. *Long.* 9 *lin.*, ♀?.

Madagascar.

MASTODODERA COCCINEA.

Magna, robusta, rufa; elytris paullo rufo-velutinis exceptis, nuda; prosterno medio, mesosterno et coxis omnibus nigris; capite fere ut in M. nodicolli, *oculis minoribus colloque crassiori; antennarum scapo subclavato: thoracis tuberibus quatuor dorsalibus fere æqualibus, tubere laterali magno, paullo curvato: elytris amplis, apice integris, supra basin versus punctulatis; tarsis posticis articuli basali triangulari haud elongato.* *Long.* 18 *lin.*, ♀.

The colour of this large and conspicuous insect is nearly that of red sealing-wax, including antennæ and legs; the black portions are confined to the coxæ and the surrounding parts of the sterna.

Madagascar.

The thorax is impunctate, and, like the rest of the body, slightly shining. Some patches of silky pubescence on the elytra have, in certain lights, a beautiful rosy tint.

MASTODODERA DIFFORMIPES.

M. nodicolli *angustior, capite, corpore subtus, antennis et tibiis nigris, thorace sanguineo, elytris fulvis subglabris margine laterali et sutura anguste nigris: pedibus posticis (præcipue tarsis) elongatis, tibiis apice intus subito dilatato-sublobatis, tarsis testaceo-flavis; femoribus omnibus rufo-castaneis basi nigris, tarsis 4-anticis nigris.* *Long.* 10½ *lin.*, ♂.

The head is more elongated in front of eyes, and the base of the antennæ proportionately more remote from the latter than in *M. nodicollis*; but the shape and granulation of the eyes are the same. Head and thorax are covered with close minute punctures; the latter has four rounded, slightly elevated tubers on the surface, besides one, more conical, on each side, a little before the middle. The elytra are less broad at the shoulders, and are singly somewhat narrowed towards the apex, the latter briefly truncated. The dilatation of the apex of the posterior tibiæ forms an obtusely angular, compressed lobe. The claw-joints of the tarsi are dilated almost as much as in *Logisticus rostratus.*

Madagascar.

Bartholomew Road, Kentish Town:
March, 1879.

Is Dytiscus latissimus found in North America?—My regretted friend, the late G. R. Crotch, has recorded this species as North American, chiefly, I believe, from information furnished to him by myself. In the Trans. Am. Ent. Soc. (December, 1876, p. 250), Dr. Horn has published the following note on the subject:—"*Dytiscus latissimus*, Lin., should not be included in our lists. I am satisfied that the species was never alive on this side of the Atlantic, and from the number of specimens sent me from time to time for determination, identical with those of England, and pinned with English pins, I am convinced that there must be great carelessness or deception on some side. We have enough species legitimately introduced without bringing dead ones on pins."—Very good, Dr. Horn!—But I am sure my talented friend will forgive me for suspecting that, notwithstanding the rather tall tone of his note, the deception may be with him; and for the following reasons, viz.: that the species does not occur in Britain, *a fortiori* not in "England," and that the British pin is evidence rather of a Canadian, than a continental-European, origin for the "number of specimens;" most Canadian collectors having formerly used British pins. Next, that the limited distribution of the species in the old world and the area in which it there occurs render it very probable that it exists also in North America, though perhaps not descending so far to the south as to reach the United States. The evidence of the existence of this remarkable species in North America is, however, undoubtedly in need of confirmation. Perhaps some Canadian reader of this magazine may be kind enough to give us a note on the point.—D. SHARP Thornhill, Dumfriesshire: 18*th March*, 1879.

Notes on some species of British Hemiptera.—*Peritrochus nubilus*, Fall. (*c. f.* E. M. M., vol. xi, 267, and xv, 202).—I took a single example out of a tuft of grass at the side of a path in Darenth Wood on 2nd October last.

Pilophorus perplexus, Doug. and Scott.—At the beginning of July, among a number of *Formica fusca*, I saw some larvæ of this species running up and down the stem of an apple tree; before the end of the month there were adults in the same situation, and shortly afterwards I found them on the various trees of the garden, where no larvæ had been seen.

The genus DICRANONEURA, or, as Hardy imperfectly wrote it, "DIKRANEURA," appears not to be accepted on the continent, *vice Notus*, Fieb. (1866), although it is identical and dates from 1850 (Trans. Tyneside Nat. Field Club, i, 423). The character of the neuration of the type, *D. variata*, is well expressed—"Wings with the upper nerves disposed in two forks, the upper opening inwardly on the base, the 2nd shorter-pronged, outwardly on the apex." This configuration is excellently represented for the same species (*Notus aridellus*, Sahlb.) by J. Sahlberg in the "Not. Fenn.," xii, tab. i, fig. 21. The "forks" lie reversed as to each other, the parallel prongs resembling those of musical tuning-forks, and are connected by a short transverse nervule, which Hardy appears to have overlooked, as he could easily do, for it is slight and mostly transparent:—he says, respecting it, "no *apparent* cross nerve."

Dicranoneura variata, Hardy.—Of this very common species the colour of the elytra varies from pale green to dark green, sometimes with a reddish flush. Mr. G. Norman lately sent some examples, taken by him at Forres, of which the greater portion of the corium of the elytra was of a deep orange-red, thus making the specific name very appropriate. This deep red colour does not appear on southern examples.

Typhlocyba blandula, Rossi.—On the 23rd March last, at West Wickham Wood, I found this species abundant on the green leaves of brambles. It is to be noticed, that, however much the red colour of the elytra varies in intensity, the portion next the costa is always clear and pale; and that in the posterior tarsi of the ♂ the last *joint only is black on the* posterior half, while in the ♀ this joint is pale like the others.

Typhlocyba tiliæ, Geoff. (*c. f.* E. M. M., xii, 79, and xiv, 132).—At the same time and place as above I took three ♂ and one ♀ from a fir tree. In this species it is to be observed that the costal area on the whole length of the elytra in both sexes has a vittate suffusion of rose colour, which is not apparent in the otherwise very similarly marked *T. blandula*. In the ♂ the posterior tarsi are wholly black, but in the ♀, except the claws, they are wholly pale.

Typhlocyba rosea, Flor.—In the E. M. M., xii, 77, I indicated this species as British, on the strength of one example, but I find now, on the re-examination of it by the side of the ♀ *tiliæ*, above mentioned, that it is only that species, and that I had not observed the peculiar great length of the 1st joint of the posterior tarsi, characteristic of *rosea*, is wanting in my example. *T. rosea* must, therefore, be expunged from our list, but I hope only temporarily, for, as it is found on spruce firs *(Pinus abies)* it may surely occur in Britain.

Typhlocyba quercus, Fab.—At the beginning of July I saw this species in all stages of existence, except the adult, on the underside of the leaves of cherry trees; subsequently, the first-developed insects were to be seen alongside pupæ, and afterwards, for two or three months, plenty of adults were to be met with on every tree in the garden.

Typhlocyba debilis, Doug. (E. M. M., xii, 204).—This still remains scarce, and hitherto I have seen only the ♀. I found one on oak at Darenth Wood, October 2nd, and one on beech at the Addington Hills, October 14th. Mr. Edwards also took one on beech at Norwich (p. 136 *ante*). M. Lethierry reports that the species has been found in France—in the Landes and the Hautes-Pyrénées (Comptes rendus Soc. Ent. Belge., 7 March, 1878)—but the food-plant is not yet ascertained.

Typhlocyba nitidula, Fab.—I have examples of this with the black colour on the corium of the elytra so much extended that it covers nearly the whole surface, and I believe, as indeed M. Lethierry himself suspects, that this form is his *Anomia Norgueti* (Hém. Nord, p. 73).

Typhlocyba gratiosa, Boh.—Last year, for the first time, I found the ♂ on beech trees, September 7th, but then newly developed and limp, there were also females; on the 27th, I obtained plenty of the ♀ fully coloured, but no males. I do not understand how, in so short a time, the males had vanished, except by supposing they had fulfilled their functions and died. The females always long survive the males.

Typhlocyba Douglasi, Edwards (E. M. M., xiv, 248).—On the 28th September I got ♂ and ♀ out of beech trees, on the leaves of which I am convinced the species must live, there being scarcely any other kind of tree in the place, and it comes only from the beech.

Eupteryx stachydearum, Hardy.—In his description of this species (Trans. Tyneside Nat. Field-Club, i, 422), Hardy says, "legs entirely yellow, or the greater part of the tarsi black." This difference of coloration is a sexual character; last autumn I captured a great many examples on some plants of balm (*Melissa officinalis*) in the garden, and found that in the male the second joint of the posterior tarsi was always more or less black, and in the female it was always pale like the other joints. There could be no doubt that they were the sexes of one species, for I saw many *in cop.*

Eupteryx melissæ, Curt.—As Curtis says, and Marshall also observes, the elytra are of a delicate sea-green instead of the more yellow colour of the preceding species; the stature is also smaller, and the tarsi are pale in both sexes. The species was abundant on the balm-plants, above mentioned, from August to October.

Eupteryx vittatus and *E. pictus* also occurred on the same plants, but not many of either.

Trioza galii, Foerst.—I find, that in some of the examples captured in August (*vide* p. 92 *ante*), the white markings on the abdomen have now disappeared, but in others they remain. I think that those authors who have not adverted to the white markings must have had before them examples in which the markings had become evanescent by lapse of time.

Aphalara exilis, Weber and Mohr.—On the 14th October I found several individuals of each sex, the male predominating, in tufts of grass growing by the road-side at the Addington Hills. I had previously sought on the heather in vain. The species has been found on fir and other trees, but, as far as I am aware, the food-plant is not known.

Aphalara polygoni, Foerst.—On the 2nd September, on a plant of *Polygonum hydropiper*, I found two examples, ♂ and ♀, so flaccid and colourless that they could not have emerged from the pupa-state for more than a few minutes. On the 28th Sept., on the same plant, I found several individuals fully developed and coloured. On previous occasions I have taken the species in autumn on fir trees, and, in June, on *Rumex acetosella*, on which last it was also found by Haliday; but it was originally discovered by Foerster on *Polygonum*.

Rhinocola aceris, Lin.—I saw a few soft, newly emerged individuals on *Acer campestre*, at Lee, on August 1st; these, I think, were of a second brood, the first appearing in June, but the occurrence of two broods has not been recorded.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *January 23rd*, 1879.

Morayshire Hemiptera.—The following species of *Heteroptera* I have added to the list published in 1877 (Ent. Mo. Mag., xiv, 165).

Microphysa pselaphiformis.

Conostethus brevis, Reuter.—In profusion, on thrift and *Carices*; Bay of Findhorn, 17th June and afterwards.

Plesiocoris rugicollis.—I have found, this season, in profusion, on hoary sallow and *Myrica gale.*

Salda lateralis, Kinloss.

Agalliastes saltitans, at Findhorn.

Agalliastes Wilkinsoni, *Dictyonota strichnocera*, *Phytocoris dimidiatus*; Burgie and Pluscarden.

Berytus pygmæus.

Dicyphus stachydis, Reuter, = *collaris*, Flor; in profusion on *Stachys*. This is the species I gave in my last list, in error, as *D. errans.*

Gerris odontogaster, Loch Romach.

The following *Homoptera* have occurred here during the past season, and have been named for me by the kindness of Messrs. Douglas and Scott.

Cixius cunicularius, Fab., *C. nervosus*, Lin., *C. intermedius*, Scott, *C. contaminatus*, Flor.

Liburnia guttula, Germ., *L. similis*, Kirschb., *L. forcipata*, Boh., *L. pellucida*, Fab., *L. extrusa*, Scott, *L. neglecta*, Flor, *L. cognata*, Fieb., *L. limbata*, Fab. *forma macroptera*, abundant in Butler's Marsh and Scrapehard Pond.

Dicranotropis hamatus, Boh. *forma macroptera*, on hazels, Sanquhar, in July.

Aphrophora alni, Fall.

Philænus spumarius, Lin., *P. exclamationis*, Thunb., *P. lineatus*, Lin.

Ulopa reticulata, Fab.

Megophthalmus scaniens, Fall.

Eupelex sp. ?, larva on a dry bank.

Acocephalus rusticus, Fab., *A. bifasciatus*, Lin., *A. albifrons*, Lin., *A. polystolus*, Fieb., *A. carinatus*, Stål.

Macropsis lanio, Lin.

Idiocerus populi, Lin., *I. confusus*, Flor.

Bythoscopus alni, Schr., *B. fruticola*, Fall.

Agallia puncticeps, Germ., *A. venosa*, Germ.

Tettigonia viridis, Lin.

Euacanthus interruptus, Lin., *E. acuminatus*, Fab.

Alebra albostriella, Fall.

Cybus smaragdulus, Fall.

Chlorita flavescens, Fab., *Ch. apicalis*, Flor.

Dicranoneura variata, Hardy, sometimes cherry-red in colour. *D. aureola*, Fall., on *Carices*, Findhorn Marsh; new to our lists (*vide* p. 202 *ante*).

Typhlocyba decem-punctata, Fall., *T. quercus*, Fab., *T. ulmi*, Lin., *T. tenerrima*, Schäff., *T. nitidula*, Fab., *T. geometrica*, Schr., *T. rosæ*, Lin., *T. alneti*, Dahlb., *T. blandula*, Rossi, *T. tiliæ*, Geoff.

Eupteryx vittatus, Lin., *E. notatus*, Curtis, Butler's Marsh, on grass, September, *E. urticæ*, Fab., *E. auratus*, Lin., *E. pictus*, Latr., *E. stachydearum*, Hardy, on *Teucrium*, *E. pulchellus*, Fall., *E. Germari*, Zett.

Cicadula sexnotata, Fall.

Thamnotettix cruentata, Panz, on *Vaccinium* and *Empetrum*, *Th. splendidula*, Fab., *Th. torneella*, Zett., *Th. intermedia*, Boh., *Th. virescens*, Fall., *Th. quadrinotata*, Fab.

Athysanus grisescens, Zett., common, Butler's Marsh, *A. sordidus*, Zett., *A. obsoletus*, Kirschb., *A. plebeius*, Fall., *A. obscurellus*, Kirschb., *A. subfusculus*, Fall., *A. prasinus*, Fall., *A. distinguendus*, Fall.

Allygus mixtus, Fab.

Deltocephalus abdominalis, Fab., *D. sabulicola*, Curtis, *D. striatus*, Lin., *D. socialis*, Flor, *D. ocellaris*, Fall., *D. pulicaris*, Fall., *D. pseudocellaris*, Flor.

Arytæna ulicis, Curtis, *A. genistæ*, Latr.

Psylla Försteri, Flor, *Ps. alni*, Lin., *Ps. buxi*, Lin., *Ps. salicicola*, Först., *Ps.* *ati*, Flor, *Ps. mali*, Först., *Ps. fraxinicola*, Först., *Ps. fraxini*, Lin., *Ps. cratægi*, p., *Ps. peregrina*, Först.

Trioza urticæ, Lin,, *T. acutipennis*, Zett., common on *Carices*, in a small loch in ar, August to December.

ra exilis, Weber and Mohr, *A. polygoni*, Först., *A. picta*, Zett., *A.*

ica, Curt., with the elytra having clear brownish dots, being the by *Flor*; common on ling, May to September.—G. NORMAN, *February*, 27*th*, 1879.

Helicopsyche bred in Europe.—The heading of the notice on *Helicopsyche* in the last number (p. 239) of this Magazine, conveyed an erroneous idea, as the context shows. For "England" read "Europe."

I have since received specimens of larvæ (with cases) and of the insect (in alcohol) from Professor de Rougemont. The ♂ is probably my *H.* (?) *sperata*; the ♀ I received was that of some *Tinodes* (or genus allied thereto), and has no connection with *Helicopsyche*. Professor de Rougemont informs me that he has since detected the true ♀.

In the published report of the Meeting of the Italian Entomological Society for November 24th, 1878, there is an apparently independent account of the breeding of *Helicopsyche* from the pens of Signor Tassinari (who described the cases as shells) and Professor Targioni-Tozzetti, the President of the Society, with an outline figure of the supposed ♀, and an imperfect description. This ♀ is also a *Tinodes*, or allied thereto.

Immediately after my previous notice was in print, I received the cases and insects of two Brazilian species of *Helicopsyche* (in the broad sense), forwarded by Dr. Fritz Müller.—R. McLachlan, Lewisham: *17th March*, 1879.

Capture of Odynerus basalis.—On the 14th July last I captured two specimens of the very rare wasp, *Odynerus basalis*, Smith, in the Isle of Purbeck. Had I known their rarity at the time I might have taken more, but I was busy in capturing other rare species, such as *Anthribus albinus*, *Clorosoma Schillingi*, *Ebulea verbascalis*, and *Pempelia Davisella*. The wasp is well described by Mr. Smith in the Entomologists' Annual for 1869, p. 73, where Mr. Rothney's capture of the species is mentioned: but, strange to say, Mr. Smith has omitted the species altogether from his List of Aculeate *Hymenoptera*. It constructs round nests of sand at the tips of the spear-like grass which generally grows on sand-hills. Next summer I hope to get more specimens and knowledge.—C. W. Dale, Glanville's Wootton, Sherborne: *Mar. 17th*, 1879.

Record of a butterfly new to the fauna of Japan.—I have recently obtained from Yokohama an example of *Charaxes Narcæus*, Westwood, and I believe this is the first specimen of the species from the Japanese Archipelago; it was originally recorded from North China.—Geo. Lewis, 3, Green Street, Grosvenor Square: 18*th March*, 1879.

On the pupation of the Nymphalidæ.—In anticipation of the event which has actually occurred, viz., the re-publication of the article on this subject, from the "Canadian Entomologist," in this Magazine, I refrained from posting a letter which was already written calling attention to the very interesting communication of W. H. Edwards, of which I had already received a copy through the courtesy of the author. I will now only ask permission to observe that we have here the existence of the ligament demonstrated in two new species, and, indeed, of different sub-families, of the *Suspensi*: and that it is found in another family, belonging to the *succincti*, viz., in *P. brassicæ* (and I believe also in *A. cardamines*), I have already shown. It becomes interesting, therefore, to enquire how far its presence may be traced in other genera and families of this Order, and I hope that, during the coming summer, much information on this subject will be obtained. Naturally differences of structure and in the mode of pupation will be observed in different species; so that inferences from observations on one or two species might lead to error if generally applied. In describing the pupation of *Grapta interrogationis*, Mr. Edwards says (p. 224), "It is a wonderful exhibition, and the last act is beyond my comprehension, namely, the rising of the chrysalis with no external aid save what comes from the ligament. I can only state the fact." If, when the chrysalis is suspended by the ligament alone, its tail is too short to reach the button of silk, it is evident these parts can only be brought together in one (or both) of two ways, viz., by the lengthening of the tail, or the shortening of the ligament. Whether or not the former contributes to the results, it does seem that not only the ligament but the whole internal lining of the caterpillar skin is elastic, or at least subject to shrink up, especially when exposed to the action of the air. In making specimens to show the ligament, I found that it was necessary not to pin it out at the full stretch it would easily bear at first, but that it must be considerably relaxed, or it was sure to part in drying from its attachment to the chrysalis. But that the tail of the chrysalis itself also increases in length by a process of *growth* is also extremely probable. At the moment of exclusion the anterior horn of the chrysalis of *A. cardamines* is a minute (ventrally) incurved process, and it may be almost seen growing till in an hour or two it had attained the complete size, when it is equal in length to the posterior horn. Mr. Edwards has noticed and remarked upon this out-growth of the mesonotum of the chrysalis of *interrogationis* (p. 224 *ante*): at first, he says, "this organ is pressed down and flattened, but in a short time, and before the transformation is completed, it swells out, and becomes nearly as large and as prominent as it ever will be." What takes place in the mesonotum of *interrogationis*, and in the anterior horn of *cardamines*, and probably more or less in all parts of the chrysalis, need only take place to a small and not noticeable extent in the tail of the suspended pupa in order to equalize its length with that of the suspending ligament, itself perhaps shrinking up under the action of the air.—J. A. Osborne, Milford, Letterkenny: *March*, 1879.

Description of the larva of Myelois cribrum.—On the 26th of April last, I received through the kindness of Mr. John Wilson, of Bermondsey, a few larvæ of this species. Some of them were apparently almost full-grown, so I described them at once, as follows:—

Length, when at rest, about three-quarters of an inch, and, when crawling, quite an inch; rather plump, and of nearly uniform width throughout; head highly polished, considerably narrower than the second segment; body cylindrical, tapering very slightly towards the anal segment; the segmental divisions well marked; there is a polished plate on the second, and a smaller one on the anal segment; skin rather soft, with a semi-translucent appearance; a short hair springs from each tubercle.

Ground colour a very pale olive-green, inclining to drab; head and frontal plate intensely black, the small anal plate not so conspicuously dark. A darker shade of the ground colour, broadly bordered on each side with dull whitish stripes, forms the dorsal band; sub-dorsal stripes white, but there are no spiracular lines; spiracles round, they, and also the tubercles and hairs, are black.

Ventral surface and prolegs very pale dingy greyish-green, the legs black and polished.

Feeds in the dried stems of thistle, eating neat circular holes through to enter a fresh stem, or to quit an old one. When full-grown spins a net-like cocoon of white threads in the cavity formed by having eaten away the pith in the stem, and in this changes to a pupa. This is about five-eighths of an inch long, slender, and of the ordinary shape; the eye-, leg-, and antenna-cases prominent, the last especially so, being raised quite on the top of the thorax, and extending from the head to the base of the wings; there are also two slight prominences extending over the base of the wings in front. Ground colour almost uniformly bright glossy pale brown, the upper side of the thorax, segmental divisions, and side tubercles, rather darker brown. The imagos began to appear on July 6th.—Geo. T. Porritt, Highroyd House, Huddersfield: *March 5th,* 1879.

On the Australian Œcophoridæ.—The extraordinary specific development of this group in Australia affords a remarkable parallel to the similar excessive multiplication of species in the genera *Eucalyptus* and *Acacia* amongst plants in the same region. Out of about 800 species of *Micro-Lepidoptera,* which I have classified, 210, or more than one-fourth, are referred to this family, placing it first on the list; the *Gelechidæ* being just short of 200. Those few which have as yet been described by Walker, Zeller, and others, have been indiscriminately cast into *Œcophora,* Z.; but it is not a little curious that I find, on examination of the venation and other characters, that there is amongst them not a single true *Œcophora* (or perhaps one only), except the imported *pseudospretella.* All alike (excepting a single genus of about fifteen species, characterised by the excessively long basal joint of the antennæ, but possessing the venation of *Œcophora*) differ from *Œcophora* in that vein 7 of the fore-wings runs to the hind margin, or in one group to the apex, never to the costa. The only European genera represented are *Harpella,* by seven species, and *Blastobasis,* by two: *Endrosis lacteella* has also been imported. The other genera are probably wholly endemic, as the group appears hardly at all represented in other main regions.

Some progress has been made towards a knowledge of the larvæ, which do not seem to have the taste of *Œcophora* for dried material. The larvæ of the genus with elongated basal joint of antennæ all feed in spun leaflets of *Leguminosæ,* chiefly *Acacia.* Others live rather gregariously, several together amongst a good deal of web, on *Eucalyptus* and other trees. From the crambideous habit of one large group of handsome species, it is tolerably certain that their larvæ must live in the roots of grass, but I have not yet succeeded in finding them. Those of another smaller genus feed beneath the fibrous bark of trees. One very abnormal insect has a case-bearing larva, the case consisting of a stout piece of straight twig, hollowed out into a cylinder; it feeds on the *Eucalyptus.* Probably the more remarkable modes of life remain yet to be discovered.—E. Meyrick, 243, Macquarie Street, Sydney: *January 20th,* 1879.

Elachista perplexella double brooded.—Last spring, at the end of March and beginning of April, I found small yellow larvæ in *Aira cæspitosa,* at the same time as those of *E. apicipunctella.* Thinking that they must be young larvæ of that insect, I did not examine them closely at the time; but found, when they left the grass, that they were still yellow. One of them fortunately pupated, and emerged as *E. perplexella,* previously only one brood (feeding in June b, and emerging in June e) appeared to be known here; so that it may be of some interest. The egg must be laid in July, and the larva hibernates.—JOHN SANG, 6, Chestnut Street, Darlington: *February 28th*, 1879.

The food and habits of Velleius dilatatus.—For a long time it was a mystery to me why *Velleius dilatatus* dwelt only with hornets, and how it happened that it also lived in harmony with them; I conjectured that the *Velleius* must in some way be of service to the hornet-colony, otherwise the hornets would not tolerate its presence, yet I was not then sure of what its food consisted. To solve this question I had again to take a hornets' nest, but on account of its unfavourable situation I could only extract from it seven larvæ, and of these only one entire, the other six were injured and perished.

As only one *Velleius* was developed, I at once, by means of a pencil, gave it honey, which it ate with the greatest avidity; as I withdrew the pencil it clung to it so fast that I could thus drag it quite round the room. On the second occasion it at once recognised the pencil and approached it; it also drank much water; and I saw that it was very readily fed,—just like a young bird. As this kind of feeding took up too much of my time I gave it a piece of sugar, on which it remained for half a day, and would not leave it until it was satisfied. Thus there can be no doubt that these insects derive their nourishment from sweets, and that they partake of the same food as the hornet-brood.

The *Velleius* tears to pieces, with the greatest tiger-like fury, all insects which are injurious to the hornet-brood, especially the *Myriopoda*—*Cryptops*, Leach, and *Scolopendra*, Koch,—; these resist so strenuously, that only a confused action can be seen, but nothing distinguished, yet their dead dry bodies are thrown about with the greatest rage on every occasion. The *Myriopoda* which live among plants and decaying matter, such as *Geophilus*, Leach, are not touched, even if they crawl about on the *Velleius*, as also is the case with all other insects which are not injurious to the brood. It is not to be attributed to the hornets that they clear out all such animals from the hollow trees they select for their nests, for I had an opportunity to examine thoroughly the inside of one tree and found no creature which could be injurious to their brood, whilst, in other hollow trees, *Myriopoda* and other predacious creatures swarmed. Thus I believe that no hornets' nest can thrive in a hollow tree without the presence of *Velleius*, and who knows whether the sharp, musky odour of this insect may not even contribute much to its security by keeping enemies at a distance?—the odour is so powerful that five or six of the *Velleius* will sensibly perfume a room. It therefore appears that *Velleius* eats the honey, and in return protects the hornet-brood, and the colony generally, by keeping off their foes.

Observation of *Velleius* soon brings conviction that it is very intelligent, at any rate, much more than most other beetles: the species is among beetles what parrots are among birds. When newly developed it is very shy, but it soon loses its wildness, at least when close to its food. It is lively and ever ready for conflict, and if disturbed from its rest, or if it becomes aware of an enemy, it springs on the intruder with out-spread wings, and uses its strong mandibles as weapons of attack. It flies easily, and this power is very serviceable, for it often has to travel great distances when seeking hornets' nests.

It occasionally happens that hornets make their nest for several years successively in the same tree; this occurs especially in oaks when the inner space is sound, but the more general case is that the walls of the cavity crumble down by progress of decay, the rain penetrates, and the nest perishes; then such trees are forsaken, and *Velleius* has to find new nests. When it is engaged in such wanderings an entomologist may occasionally find an example, but in greater number it is only to be obtained in hornets' nests.

J. Erné (Mittheilungen der schweizerischen entomologischen Gesellschaft, vol. v, p. 369, September, 1878).

[This article, which contains much that is new and interesting, forms the sequel to an excellent communication, by the same author, on the natural history of the *Velleius*, published in the "Mittheilungen," vol. iv (1877), but which is too long to reproduce here: I may, however, revert to its salient points hereafter.—J. W. D.]

Entomological Society of London.—*5th February*, 1879. Sir J. Lubbock, Bart., M.P., V.P.R.S., President, in the Chair.

The President named Messrs. H. W. Bates, J. W. Dunning, and F. Smith, as Vice-Presidents for the year.

Mr. Elwes exhibited a very interesting collection of *Lepidoptera* from an island at the mouth of the River Amur. The species generally were very European in character, and specifically identical with ours in some cases. Two of the most striking insects were (1) a butterfly, recently described as *Lühdorfia Putziloi*, closely allied to the genus *Thais*, and remarkable for the female possessing curious large waxy-looking abdominal appendages; (2) *Saturnia Artemis*, allied to the North American *Actias Luna.*

Mr. C. O. Waterhouse exhibited a curious spider from West Africa, recently described by Mr. Butler as *Gasteracantha Cambridgei*; in form and colour it strikingly resembled a small crab.

Mr. Champion exhibited the example of *Harpalus oblongiusculus*, recorded in this Magazine at *ante* p. 203.

Mr. Swinton called attention to a statement by Mr. Wood-Mason to the effect that a *Mantis* had never been heard to stridulate, and referred to Kirby and Spence's Introduction to Entomology, 7th ed., p. 493, where it is stated that Colonel Goureau has noticed that *Mantis religosa* when alarmed produces a sound by rubbing the sides of the abdomen against the borders of the wings and elytra.

The Rev. A. E. Eaton read notes on the homologies of neuration in insects, and, acting upon Professor Westwood's suggestion at the Meeting on December 4th, he had prepared a number of diagrams of the neuration of various *Lepidoptera* and *Trichoptera*, coloured so as to show the homologising nervures, &c.

The Secretary read a note by Dr. Fritz Müller with reference to the mimicry of species of *Acræa* by *Eueides pavonia*, in which he remarked that this case presented the singular feature of the mimicking butterfly agreeing more closely with the males of that mimicked, instead of with the females as is usual.

Mr. Butler read a paper "On the *Lepidoptera* of the Amazons, collected by Dr. Trail," part iii, *Noctuites.*

Mr. C. O. Waterhouse read a description of a new genus and species of *Curculionidæ*, found in an orchid house in England.

Mr. F. Moore communicated "Descriptions of the species of the Lepidopterous genus *Kallima.*"

March 5*th*, 1879.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

The Chairman, in a short address, referred feelingly to the great loss the Society had sustained by the death of Mr. Frederick Smith, who had been again nominated as one of the Vice-Presidents at the previous meeting.

Mr. J. T. Harris, of Burton-on-Trent, was elected a Subscriber; and Mons. C. Brongniart, of the Musée d'Histoire Naturelle, at Paris, was elected a Foreign Member.

Sir S. S. Saunders exhibited a series of species of *Halictus* from Greece, including new forms.

Mr. Wood-Mason recurred to Mr. Swinton's observations at the previous meeting regarding the stridulation attributed to *Mantis religiosa*, by Col. Goureau, and denied the existence of any true stridulating organs in the insect, the noise being merely caused by the rustling of the wings.

Mr. W. Cole called attention to Dr. Kerner's essay on "Flowers, and their unbidden Guests," in which it was suggested that flowers were, as a rule, not attacked by larvæ, because they contained principles distasteful to them. Mr. Cole was of the opinion that the caterpillars, in neglecting flowers, had a regard for their own safety, rather than that they found them distasteful, and alluded to the fact, that the larvæ of many species, and even of almost entire genera, feed by preference on flowers. Mr. Meldola saw no difficulty in Dr. Kerner's statement, and suggested that in the case of flower-feeding larvæ, the digestive organs might be so modified as to permit of the colouring matter being permeated in an unaltered condition, in the same manner that chlorophyl passes unaltered into the tissues of green caterpillars that feed on leaves, as had been proved spectroscopically.

Mr. Elwes mentioned an instance of injury to bulbs of *Sternbergia* by some larva, which Mr. McLachlan suggested was probably that of the dipterous genus *Merodon*.

Dr. Sharp communicated a paper on *Coleoptera* from the Hawaiian Islands.

Mr. Cameron communicated a paper on new or little known species of British *Hymenoptera*.

Reviews.

THE BUTTERFLIES OF NORTH AMERICA, by W. H. EDWARDS; 2nd series, part vii, 4to. Boston—Houghton, Osgood & Co.; London—Trübner & Co. 1878.

We have frequently, on former occasions, spoken in terms of unqualified praise of preceding parts of this magnificent work. The part before us maintains the high reputation the author has gained amongst entomologists to its fullest extent; in fact it is, if possible, an advance on all previous parts, both in the beauty of the plates and the excellence of the text. The first plate, with four figures, is occupied by *Papilio Indra*, Reakirt, a species of very local distribution, and apparently confined to Western California. On the second plate, with eight figures, are represented *Anthocharis Genutia*, F., and *Julia*, Edwards, two species with curious falcate anterior-wings. The third plate, with eight figures of the butterfly and many of the larva, &c., is devoted to *Colias Eurytheme*, Boisd., to which are united *Keewaydin* and *Ariadne*, *Edw.*, as polymorphic conditions. We have no space to devote to a consideration of the manner in which the author shows that the various forms are due to the brood to which they belong, the species varying from two-brooded to many-brooded according to locality. The fourth and fifth plates are crowded with figures of *Phyciodes* (an extensive American genus allied to *Melitæa*). Of various forms of *Ph. Tharos* there are no less than twenty-seven figures of the butterfly and many of the egg, larva, and pupa. Two other species, *Ph. Phaon* and *Vesta*, are also represented. The author regards all these as originally one, but *Phaon* and *Vesta* having become established as distinct species, remain so, whereas *Tharos* appears in all sorts of seasonal and other forms. By a series of patient experiments in breeding from particular batches of eggs, and by subjecting some of them to artificially cold temperatures, the author succeeded in manufacturing (if we may use such a term) seasonal forms almost at will, and even in producing forms that in nature were only looked upon as remarkable aberrations. It should be remarked that seasonal dimorphism (or polymorphism) is almost as strongly marked in the larvæ of these insects as in the imago. The whole history is so interesting that short extracts could not do justice to it; it is a striking exemplification of how very little we know of the habits of the many thousands of so-called species of butterflies that exist on paper, and it is one more proof of the necessity for concentration in the studies of entomologists.

NOTES OF OBSERVATIONS ON INJURIOUS INSECTS. Report for 1878, drawn up by E. A. ORMEROD. 8vo, pp. 27. London—West, Newman & Co. 1879.

Miss Ormerod (assisted by other entomologists) is doing good work in her disinterested endeavours to spread a knowledge of the habits of injurious insects amongst horticulturists and agriculturists. This third Report is nicely got up and the illustrations will attract the attention of those for whose benefit it is intended. Twenty-one species, of various Orders, are treated upon. It was a mistake to include *Colias Edusa* among the pests; we do not suppose that any one was a penny the worse off for the extraordinary abundance of this beautiful butterfly in 1877, and by associating it with bad company, Miss Ormerod may unwittingly add to its persecution, as if it had not enough already in "picture" makers, bird-stuffers, and small boys; but it is expressly stated that it is included in the hope that observations on its habits may throw some light upon other intermittent appearances, such as that of *Athalia spinarum*, &c. We believe we are correct in stating that these Reports are intended for gratuitious distribution.

Obituary.

Frederick Smith.—In our last number (*ante* p. 240) we briefly announced the death of this well-known entomologist, under peculiarly painful (and almost sudden) circumstances, after a surgical operation, at the age of 73.

He was born, we think, in London, in 1805, of Yorkshire parents, but we are unacquainted with his early history. His occupation, when he became known as an entomologist, was that of an engraver on steel, and to this, by no means at any time lucrative employment, was added that of a small business in the south of London. As an engraver he was instrumental in the re-production of the works of several celebrated artists. At the same time he was deeply engaged in entomological pursuits, and especially on observations on the habits of *Hymenoptera*. These pursuits, combined with his skill as an engraver, probably brought him under the notice of John Curtis; at any rate, we know the latter was assisted by him in some of the later plates of the "British Entomology."

For a short time he was Curator to the then young Entomological Society of London. After the death of Edward Doubleday, in 1850, he was appointed an Assistant in the Zoological Department of the British Museum, and, in 1875, he became Senior Assistant, which post he held at the time of his death. He was President of the Entomological Society of London in 1862 and 1863.

It is not possible for us to give even the titles of the papers published by him in the Journals and the Transactions of various Societies, to the number of over one hundred. Many of these, combined with his general "Catalogues" of the *Hymenoptera* in the British Museum, were executed "to order," and were better than could be said of the bulk of contemporaneous publications issued from the same source. In these, as in all his work, he suffered from the want of general and special education; it is a marvel he succeeded so well. He was more fitted for a field naturalist. In the field he was at home; in the study his enforced work must have cost him painful and arduous labour. His keen powers of observation rendered all his field work of the utmost value, and the results appear (especially) in his various "Catalogues" (unfortunately of necessity so termed) of the British *Hymenoptera*, published by the British Museum, which were illustrated (as were many of his other papers) by plates drawn and engraved by himself, and of surpassing accuracy. His "Catalogues" of the British Aculeate and Fossorial *Hymenoptera* are in the hands of all. So lately as 1876, a "Catalogue" of British Bees, from his pen, was published, practically a second edition of that which appeared in 1855, and it might have been better for the author's reputation if this second edition never had appeared, for it shows too plainly his inability to keep pace with the progress of scientific knowledge; the modern system of minute analysis was too much for him. It is only to a few that is given the power of accommodating themselves to conditions up to an advanced age: how many of us will be among those few, or know when to stop?

It is not by his monographic or literary work that the name of Frederick Smith will endure. It *will* endure from his conscientious and original observations in the field. We have heard a great deal lately of the lives of such men as Thomas Edward and Robert Dick. It was to this class that Frederick Smith originally belonged; if circumstances had permitted him to accumulate the same amount of general knowledge and to attain the same position, without the necessity of doing clerk's mechanical work, the world would have mourned the loss of a naturalist of a high order.

His attention was not confined to *Hymenoptera*. His knowledge of *Coleoptera* (especially *Curculionidæ*) was extensive, and his British Museum work included a Catalogue of *Passalidæ*.

It will be strictly in keeping with his conservative character if we allude to the tenacity with which he adhered to old ideas as opposed to modern. This was strikingly exhibited in the manner in which he persisted in acting the part of champion against those who, on the testimony of modern scientific explorers, ventured to doubt the luminosity of *Fulgora*: we might cite other analogous instances.

Socially he will be long missed, for he added much to the enjoyment of many festive gatherings of entomologists and other naturalists.

He leaves a widow, three sons, and a daughter, to deplore the loss of a good husband and father. One of his sons is well known as an artist in natural history subjects; another is earning fame for himself as a conchologist in the British Museum.

In referring to his Museum work, we must not forget the unwearying kindness and courtesy with which during many years he assisted students and other visitors to the Insect room; and the generosity and trouble which he bestowed in naming and adding to the collections of beginners.

DESCRIPTION OF TWO NEW EUROPEAN SPECIES OF *PSYLLIDÆ*.

BY JOHN SCOTT.

Genus TRIOZA, Först.

TRIOZA DICHROA.

♂. Black. *Face-lobes* long, projecting somewhat forward, somewhat stout at the base, apex acute, almost as long as the crown down the centre; divergence not so great as the base of either. *Antennæ* white, 1–2 joints black, apex of the latter white, from about 5–8 brownish, 9–10 black. *Elytra* clear, transparent, apex somewhat acute, about 2½ times as long as broad; costal margin considerably convex from the base to the apex, and forming a continuous curve, dorsal margin slightly convex from the apex to the inner branch of the dorsal fork, then slightly concave to the claval suture where it recurves to the base; nerves fine, slightly brown, especially towards and at their apices; radial cell lanceolate; nervelets brown or fuscous; exterior branch of the dorsal fork forming a long curve. *Legs* pale yellow. *Abdomen* and *genitalia* green.

Head: crown and *face-lobes* black, the latter long, projecting slightly forward, viewed from the side very slightly concave on the anterior margin; almost as long as the crown down the centre; somewhat stout at the base, apex somewhat acute; divergence not so great as the base of either. *Antennæ* white, 1–2 joints black, apex of the latter white, from about 5–8 brownish, 9–10 black.

Thorax: pro- and *mesonotum* black, except the apical portion of the latter, which is pale yellow. *Elytra* clear, transparent, about 2½ times as long as broad, apex somewhat acute; costal margin considerably convex, and from base to apex forming an almost continuous curve; dorsal margin slightly convex from the apex to the inner branch of the dorsal fork, then slightly concave to the claval suture, where it recurves to the base; radius slightly convex towards the dorsal margin; radial cell lanceolate, length of the cell, measured on the costal margin, a little longer than the distance between the apex of the elytron and that of the cell; nerves slightly brown, especially at their apices; nervelets brown or fuscous; exterior branch of dorsal fork forming a long curve. *Sternum* pale yellow or slightly brownish. *Legs* pale yellow; *tarsi*—1st pair generally black.

Abdomen green; genitalia green, processes, viewed from the side, broad, somewhat rectangular; length about 1½ times the breadth of the base, outer margin concave at the apex, so that it appears to be produced into a short tooth; inner margin with a minute blackish spot at the apex; genital plate as high as or a little higher than the processes, base broad, apex narrow, exterior margin somewhat "ogee"-shaped, apex acute, upper margin concave.

♀. Pale yellowish-green. *Eyes* purplish. *Face-lobes* pale, slightly projecting forward and somewhat concave on the anterior margin, as in the other sex. *Legs* pale; *tarsi*—1st pair pale, 2nd joint black; 3rd pair, *tibiæ*—vandykes (or frills) at the apex black.

All the other characters as in the ♂. Length, 1 line.

Astrakán.

In appearance somewhat like *T. abdominalis*, Flor, but the great difference lies in the form of the exterior branch of the dorsal fork of the cubitus, also in the shape of the genital organs of the ♂.

I have been enabled, through the kindness of M. Jakowleff, to describe this and the following species, but in neither case does he furnish me with the name of the food-plant or the date of capture.

Genus APHALARA, Först.

APHALARA JAKOWLEFFI.

Chocolate or reddish-brown. *Crown*, *pro-* and *mesonotum* thickly punctured, having somewhat the appearance of being very finely scabrous. *Elytra* opaque, with a broad, almost black, velvety band round the apex, in which is a narrow, white transverse line; *costal margin* at the base slightly, and at the centre very perceptibly, concave; radial cell elongate, apex acute. *Wings* white, opaque; costal nerve for half its length from the base brownish-yellow, ulna red. *Legs* red-brown; *thighs* and *tibiæ* on the sides with narrow, transverse, slightly waved, frosted, silvery-white bands; *tarsi* and *claws* of the 3rd pair red. *Abdomen* above almost black, with a yellow line down the centre, widening to the apex; beneath, deep yellow; genitalia of the ♂ deep yellow.

Head: crown thickly punctured, having somewhat the appearance of being very finely scabrous. *Antennæ* yellowish or somewhat ruddy-brown, 1–2 joints ruddy-brown; 9–10 black, base of the former broadly yellowish or ruddy-brown.

Thorax: pro- and *mesonotum* thickly punctured, having somewhat the appearance of being very finely scabrous. *Elytra* opaque with a broad, almost black, velvety band round the apex, in which is a narrow white line extending from near the upper nerve of the furcation of the superior arm of the cubitus to, or slightly beyond, the upper nerve of the inferior arm of the same; *costal margin* at the base slightly concave, at the centre very perceptibly concave; *radial cell* elongate, apex acute, length about two-thirds the distance from the base to the apex; dorsal marginal appendage and nerve deep, velvety, brown-black, with two white oblong spots between the claval suture and the first nerve of the fork of the cubitus, round the apex a broad, almost black, velvety band, in which is a narrow white line (sometimes having a few very minute black dots on its surface) traversing the space between the upper nerve of the furcation of the superior arm of the cubitus to a little beyond the upper nerve of the inferior arm of the same; marginal apices of the nerves white; next the costal margin and extending to the apex of the radial cell a triangular, almost black, velvety patch, divided by a trapezoidal white spot, interior to this last is a triangular, more or less distinct, pale brown patch extending across the elytron, having its apex on the costal margin near the commencement of the concavity of the same.

Wings white, opaque; costal nerve for half its length from the base brownish-yellow; ulna red. *Legs* red-brown; *thighs* and *tibiæ* on the sides with narrow, transverse, slightly waved, frosted, silvery-white bands; *tarsi* and *claws* of 3rd pair red.

Abdomen above almost black, with a deep yellow or orange-yellow line down the centre, widening to the apex; beneath deep yellow or orange-yellow; *genitalia* of the ♂ deep yellow, side view somewhat roughly resembling a 7-shaped character. Length, 1¼ line.

Astrakan.

Unlike every other European species with which I am acquainted.

1, St. Mildred's Terrace,
Bromley Road, Lee, S.E.:
2nd March, 1879.

DESCRIPTION OF A NEW GENUS AND SPECIES OF HETEROMEROUS *COLEOPTERA* OF THE FAMILY *CISTELIDÆ* FROM HONOLULU.

BY CHAS. O. WATERHOUSE.

The species here described has been in the British Museum collection for some years, but without a name. Upon examination it has proved to be new to science, and to have characters which separate it from any genus known to me. I propose to call the genus *Labetis*.

LABETIS, *n. gen.*

Eyes reniform, widely separated above. Anterior coxæ slightly separated. Anterior tibiæ flattened, gradually but slightly becoming wider from the base to near the apex, at the apex suddenly enlarged on the outer side; the tibiæ of the intermediate and posterior legs slightly enlarged at the apex. The 3rd and 4th joints of the anterior and intermediate tarsi furnished with a lamella, the 3rd joint of the posterior tarsi has a well developed lamella. The other characters as in *Allecula*, as given by Lacordaire (Gen. Col., v, p. 502).

This genus closely resembles *Allecula*, but the anterior tibiæ are unlike those of any of the family, resembling slightly those of *Microzoum* in the *Opatrides*, but more elongate, and without any mesial tooth.

LABETIS TIBIALIS, *sp. n.*

Elongato-ellipticus, convexus, flavus, nitidus, subtus piceus; thorace dense punctato; elytris fortiter punctato-striatis, interstitiis sat convexis crebre punctatis. Long. 5½ lin.

Sordid yellow, moderately shining, less so on the head and thorax; body beneath shining, pitchy. Head densely and rather strongly punctured. Thorax one-third broader than long, gently convex, gently narrowed from the base to the front, densely and strongly punctured, the anterior angles obtuse and not prominent, sides gently arcuate anteriorly, the posterior angles nearly right-angles, but blunt.

Elytra at the base distinctly broader than the thorax, the apical third arcuately-attenuated, strongly striated, the striæ closely and rather strongly punctured, the interstices gently convex, moderately, distinctly, and closely punctured. Antennæ slender, about three-quarters the length of the elytra.

Hab.: Honolulu, Hawaiian Islands.

A single example received from the late Mr. W. Harper Pease.

British Museum: *March*, 1879.

DESCRIPTIONS OF TWO SPECIES OF *CÆNIS* (*EPHEMERIDÆ*) FROM LAKE NYASSA.

BY THE REV. A. E. EATON, M.A.

A packet containing specimens of *Cænis*, and endorsed "Edible midges, which the natives of Nyassa make into cakes," was forwarded to me by Mr. H. B. Cotterill last December. They were caught by him on board a boat, about the middle of the lake, between Livingstonia and Makanjeras, while passing through a cloud of them, on the 25th of January, 1877. The gloominess of the suburban atmosphere in winter has caused their determination to be delayed. They represent the following two species, of which the second appears to be the most plentiful.

CÆNIS KUNGU, *sp. n.*

Imago sicca.—Corpus isabelinum v. furfurosum, subtus pallide ochraceum, femoribus lutescentibus, tibiis tarsisque albidis, nisi tibiâ anticâ maris forsan pallide nigricanti exceptâ. Alæ vitrinæ, pallidissime costas versus plus aut minus infuscatæ, costâ cum nervis paucis proxime sequentibus nervulisque transversalibus interjacentibus atro-piceis.

Long. corp. ♂ *circiter* 3·5, ♀ 4·5—5·0; *al.* ♂ 3·0, ♀ 3·5—3·75; *set.* ♂ *subim.* 1·75 *mm.*

CÆNIS CIBARIA, *sp. n.*

Imago sicca.—Caput supra nigricans, antennis albis. Thorax pallide fuscescens, suturis apiceque mesothoracis nigris. Pedes albidæ, femoribus supra maculâ unicâ trigonali præapicali nigrâ magnâ, coxisque extra nigris. Alæ vitrinæ crassioribus nervorum cum nervulis transversalibus interjacentibus plus aut minus opace nigricantibus. Abdomen supra nigricans, ad juncturas late lateraque versus albidum, atque segmentis 2—6 *vel* (♀) *minus opacis, vel* (♂) *albidis: subtus ubique pallidum.*

Long. corp. ♂ 2·5—2·75, ♀ 4·0; *al.* ♂ 2—2·25, ♀ 3.0 *mm.*

I may add, that some outlines of part of the external anatomy of these species will be found in the Appendix to the Journals of the late Captain Elton, recently published by J. Murray.

Bromley, Kent: *19th March*, 1879.

ON HETEROCEROUS *LEPIDOPTERA* COLLECTED IN THE HAWAIIAN ISLANDS BY THE REV. T. BLACKBURN.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The following is an account of two small series of moths forwarded by the Rev. T. Blackburn during the past year.

The entire collection represents fifteen species, of which ten are new to science; this unusual percentage of novelties is probably due to the wholly unworked localities in which most of them have been obtained.

Fortunately, in the present instance, collector's notes of considerable interest accompany the insects.

LEUCANIIDÆ.

LEUCANIA PHOTOPHILA, *n. sp.* (No. 60):

Greyish whity-brown, sericeous; primaries with seven triangular marginal black dots; an arched discal series of seven or eight epineural black dots; secondaries slightly greyer in tint than the primaries, with the outer margin irregularly white from the radial vein to the anal angle; the veins terminating in indistinct dusky dots; fringe white; abdomen whitish, tinted with yellow towards the anal extremity; under-surface of the wings sericeous white; primaries with a marginal series of six or seven black dots: body below sordid whitish; tarsi grey banded with white at the extremities of the joints. Expanse of wings, 1 inch, 5 lines.

"Occurs about Honolulu, generally flying to light in the evening, much more rarely than *L. dislocata.*"—T. B.

NOCTUIDÆ.

AGROTIS SUFFUSA, W. V. (No. 55).

Oahu.

This species did not come in previous consignments, it is perfectly distinct from the insect noted in E. M. M., xiv, p. 185, which is identical with the following—

AGROTIS, *sp. n.* (No. 11).

A single example; it arrived in six or seven pieces, being apparently rotten from damp: although I have succeeded in patching it together, it is not fit to be made into a type: in marking it somewhat resembles *Spælotis.*

AGROTIS ARENIVOLANS, *n. sp.* (No. 7).

Silver-grey, shining; primaries with blackish costal margin, interrupted by three white dots towards the apex: discoidal cell smoky-brown, excepting at the base, discoidal spots smoky-brown with white border edged with black, the "orbicular" spot pyriform, the "reniform" semicircular, its front margin being also bisinuate; median vein white; a large, fusiform, black-edged, sub-median, smoky-brown patch, attenuated towards the base; two similarly coloured patches at the base of the median interspaces, and a third on the last sub-costal interspace; two black dashes on the radial interspaces, and a third in the sub-apical furca of the sub-costal vein; an irregular smoky-brown marginal border, its inner edge zigzag; a marginal series of black spots, followed at the base of the fringe by a slender whitish line; secondaries slightly brownish, with white fringe; antennæ, crest and front of collar dark grey; centre of collar occupied by a curved white line, back of collar brownish; thorax longitudinally streaked at the sides with brownish, and with a blackish dorsal crest; abdomen brownish, clothed at the base with white hair: under-surface white; primaries sordid, the discoidal area grey; internal border opaline; a series of blackish marginal dots; secondaries with a broad silvery-greyish external border, limited internally by a sub-angulated grey stripe: discoidal cell terminating in a small black spot; palpi, tibiæ, and tarsi dusky; anal tuft pale testaceous.

Expanse of wings, 1 inch, 5—7 lines.

♂, ♀. "Island of Maui, flying by day on sandhills near the sea."—T. B.

This species belongs to the *A. jaculifera* group, its nearest ally is apparently *Agrotis munda* of Australia, but it differs very greatly even from this species, at first sight seeming more nearly to resemble Felder's "*Mamestra maori?*"

HYDROCAMPIDÆ.

OLIGOSTIGMA CURTA, *n. sp.*

Closely allied to *O. obitalis* from Australia, with which it agrees in marking, but smaller with much shorter primaries: white, the body crossed by black-edged orange belts; wings with slender black marginal line, close to which is an orange stripe; a sub-marginal black line; a black-edged orange discal belt; primaries with a second more slender stripe, the upper half of which is almost wholly orange, and widely convex, so as to cross the disc just beyond the cell; a black discocellular dot; two black oblique stripes across the basal area and parallel to the lower half of the inner discal stripe, the outer of these two varied with orange; secondaries crossed by two black lines, the outer one of which is abruptly elbowed so as to join the discal belt near the middle: under-surface paler than the upper-surface.

Expanse of wings, 6½ lines.

"Not uncommon about grassy streams in mountain valleys, when such can be found, and that is seldom."—T. B.

BOTYDIDÆ.

BOTYS ACCEPTA, Butler (No. 17).

A small example of this apparently common species.

BOTYS CONTINUATALIS (*Salbia continuatalis,* Wllgr.) (Nos. 21, 22).

"About the commonest Lepidopteron here."—T. B.

Wallengren's description of this species must have been taken from a rubbed example. I therefore append a more complete description:—

Sepia-brown, scarcely shining; wings crossed by a nearly straight, internally black-edged white stripe, slightly sinuous on the primaries, and continued inwards to a short distance along the inner margin; discocellulars black; external border greyish, an almost marginal narrow black stripe, the extreme margin also very slenderly blackish; fringe pale, white in secondaries: primaries with two more or less prominent, divergent, whitish, longitudinal streaks, the upper one just above the median vein, from the emission of its first branch to the black edge of the discal stripe, the lower one from the base to near the middle of the interno-median interspace: abdomen with white edges to the segments: under-surface pale sericeous greyish-brown, wings crossed by an inconspicuous paler stripe corresponding with the white stripe of the upper-surface: fringe of palpi white, legs sometimes white below, body occasionally whitish with pure white segmental bars; sides of palpi black.

Expanse of wings, 1 inch, 1—3 lines.

I have founded this description upon four tolerably fresh examples; one of these has the ground-colour of the primaries rather more rufous than the secondaries, but is in other respects perfectly typical: the species, as might have been supposed from Wallengren's description, is quite unlike any form of *Salbia*, and is evidently allied to *B. accepta.*

BOTYS DEMARATALIS, Walker (No. 19).

"Very local, occurs in high mountain localities, five or six miles from Honolulu."—T. B.

BOTYS LOCALIS, *n. sp.* (No. 61).

Greyish-fuliginous, irrorated with black scales: wings with whitish external border and fringe, extreme margin and a submarginal series of almost confluent dots, black; primaries with a black dot in the cell, and slightly concave discocellular line; two slightly wavy blackish lines from the median vein to the inner margin; a diffused, arched, dark, discal streak; secondaries with an oblique, dark brown discocellular line; an undulated and sub-angulated, dark brown discal line, bounded externally by a pale diffused belt: posterior edges of the abdominal segments pale, but not white; under-surface altogether paler, palpi with white fringe, tibiæ and tarsi whitish; the discal line of secondaries not bounded by a pale belt as on the upper-surface. Expanse of wings, 9½ lines.

"A very local species; Oahu."—T. B.

MECYNA EXIGUA, *n. sp.* (No. 62).

Primaries white, densely irrorated with black; two ill-defined, white-edged, black basal spots; a trisinuated, white-edged, oblique black line just before the middle; a second zig-zag, white-edged, black line limiting the external border, which is blackish, crossed by a sub-marginal series of white-bordered black dots; outer margin grey; a marginal series of black dots; fringe grey, traversed by a dusky line; secondaries ochreous, with a broad, binsinuated, external, black-brown border, which emits a streak along the median vein to the base; external half of abdominal *border also blackish*; fringe ochreous, tipped with blackish: head and thorax white, flecked with grey; abdomen pale sordid ochreous: primaries below shining leaden-grey; the costal margin, internal border, and base of fringe white; secondaries pale stramineous; apex irrorated with grey; three apical, marginal, angular, blackish lituræ; fringe at apex tipped with grey: body below white, palpi grey.

Expanse of wings, 8½ lines.

"Flies by day over flowers in hot sunshine; Maui."—T. B.

Allied to *M. ornithopteralis*, but with considerably shorter palpi, and altogether much smaller.

LARENTIIDÆ.

LARENTIA INSULARIS, *n. sp.* (No. 63).

Primaries silvery-white, densely irrorated with sooty-black, the base and a broad irregular oblique belt of the usual form sooty-black, traversed by numerous parallel, zig-zag jet-black lines; discocellulars jet-black; a costal sub-apical sooty-black spot, bounded externally by an undulated white line; a regularly sinuated sub-marginal blackish line, alternately spotted with black and white (the white spots being placed upon the veins, and the black spots between them); a marginal series of jet-black spots in pairs; fringe grey, traversed by a blackish line; secondaries silver-grey, with a feeble pearly lustre; a central, irregular, slightly darker but indistinct belt; marginal black spots and fringe as in primaries: body grey, flecked with black; posterior margins of the abdominal segments spotted with black and edged with white: under-surface silver-grey, wings with slightly darker basal area and broad central belt traversed by wavy pale lines; discocellular spots black.

Expanse of wings, 1 inch, 5 lines.

Seems to come nearest to *L. Kollariaria*, but, excepting in structure, more nearly resembles *Petrophora prunata var. nubilata* of Packard's Geometrites: the species, according to the Rev. T. Blackburn, "occurs sparingly on Haleakala, elevation 900—1000 feet."

"I succeeded in capturing only two specimens; and expense, labour, and time involved in visiting the locality are so great, as to render a repetition of my visit improbable."—T. B.

PSEUDOCOREMIA PALUDICOLA, *n. sp.* (No. 58).

♂. Primaries above varying from golden-brown to shining fuliginous, speckled with black, crossed almost in the middle by an irregular dusky belt, the inner margin of which is bisinuated, and the outer margin multisinuate and sub-angulated, both margins marked upon the veins by black dots; reniform spot well marked, blackish; indications of a dusky line limiting the external area; a marginal series of black spots: secondaries pale pinky-brown, frequently with a central undulated series of blackish spots: body coloured in correspondence with the wings: under-surface pale shining sandy-brown, with the internal areas of the wings (particularly the primaries) more or less suffused with silvery-grey; the whole surface irrorated with black or grey; the discocellular, and a more or less extended discal series of spots, black.

Expanse of wings, 1 inch, 1—2 lines.

♀. Larger, the wings more elongated, the ground colour of the primaries lighter or darker fuliginous; the central belt indistinct: otherwise as in the male.

Expanse of wings, 1 inch, 4—5½ lines.

"The dark form is the ordinary one. I bred a lot from pupæ, so *know the lighter* form (of which I got three) is pretty certain a variety. It is very local, occurring here and there in profusion in marshy spots high up the mountains."—T. B.

SCOTOSIA RARA, *n. sp.* (No. 59).

Primaries above dark fuliginous-brown, flecked with black; limits of the central belt indicated by two irregularly undulated transverse black lines; reniform spot distinct, black-edged; a sinuous sub-marginal pale line limited internally by a diffused blackish stripe, and bounding the external area; a marginal series of black spots, enclosing whitish dots; fringe blackish; secondaries sericeous greyish-brown, traversed by a series of blackish dots beyond the cell: body coloured to correspond with the wings: primaries below greyish, flecked with blackish, costa sandy-yellowish flecked with black; discocellulars dusky; a discal series of blackish spots, becoming quite black towards the costa; a marginal series of black spots; secondaries whitish, speckled with blackish; a dusky triangular discocellular spot; a bisinuated discal series of black spots; a marginal series of black spots; fringe grey: body below sordid white, legs marbled with black. Expanse of wings, 1 inch, 10 lines.

Although the example is not in good condition, I have described it, as Mr. Blackburn tells me that it was obtained at a place which he may never visit again, and seems to be both rare and local. "It occurred upwards of 4000 feet above sea level, on Haleakala (an extinct volcano); island Maui." The male, which Mr. Blackburn retains, has strongly pectinated antennæ. This *Scotosia* is most nearly allied to *S. dubitata.*

PHYCIDÆ.

PLODIA INTERPUNCTALIS, *Hübner* (No. 23).

Mr. Blackburn remarks of this species, "Apparently a *Phycis*; very likely not indigenous, I have not found it commonly."

TINEIDÆ.

SCARDIA LIGNIVORA, *n. sp.* (No. 56).

♂. Ground colour of primaries sericeous whitish, irrorated with blackish scales; costa crossed close to the base by a black spot; an oblique brown bordered black dash from the sub-costal nervure to the inner margin, followed by two or three black dots; remainder of the wing occupied by three alternate triangles margined and intersected by a W-shaped white line; the first and third areas (bounded by the white line) blackish, the second area enclosing two brown spots; three elongated impressed black spots bounding the outer edge of the white line near apex; fringe white; secondaries silvery, slightly brownish towards apex; fringe whity-brown: thorax whity-brown, flecked with darker scales, head whitish; abdomen grey, with whitish edges to the segments: under-surface metallic-silver, without markings.

Expanse of wings, 10½ lines.

♀. Larger than the male, the ground colour of primaries pinky, the dark areas less distinct, washed with laky-brown, the first triangular area interrupted by a longitudinal black discoidal dash, which is broken near its inner extremity by a whitish spot; secondaries greyer, abdomen ochraceous both above and below, wings below of a greyer silvery-colour. Expanse of wings, 1 inch.

"Bred from larvæ feeding on very rotten wood, in mountain forests; Oahu."—T. B.

This species is very distinct from any *Scardia* hitherto recorded.

British Museum: March, 1879.

DESCRIPTIONS OF NEW SPECIES OF *TRICHOPTERA* FROM SCANDINAVIA.

BY PASTOR H. D. J. WALLENGREN.

LIMNOPHILUS INSTILLATUS.

Alis anticis fuscis, punctis vitreis rarioribus sparsis, lineola vitrea ad thyridium et ad arculum maculaque ad anastomosin sat magna vitrea; posticis fumato-vitreis, apicem versus obscurioribus; pedibus testaceis, anteriorum tibiis tarsisque fuscescenti submaculatis; tuba anali fœminæ lata, superne visa in apices duos subdivergentes desinente, sed a latere visa margine superiore arcuatim profunde excisa, deinde obliqua et in angulum obtusum infra desinente. ♀. *Exp. alar.* 21 *mm.*

Ad Bergen *Norvegiæ a Dom.* Siebke *defuncto quondam lectus mihique donatus.*

L. auriculæ *similis, sed punctis pallide vitreis, macula fenestratâ alarum anticarum carenti, formaque tubæ analis abunde distinctus.*

LIMNOPHILUS SCALENUS.

Alis anticis griseis, pallido-flavicanti obsolete irroratis, cellula discoidali scapo duplo longiore, cellula dorsi exteriore haud ad finem cellulæ discoidalis extensa, cellulisque apicis 1^{ma} *et* 2^{da} *ad basin latissimis; posticis vitreis, subinfumatis, cellula discoidali scapo fere longitudine æquali, furcaque cubiti contra tertiam partem cellulæ discoidalis incipiente; appendicibus analibus maris superioribus longis, exsertis, a latere visis obtuso-acutis, inferne haud excisis; intermediis pallidis, valde exsertis, porrectis, connexis, sensim angustioribus, reliquis longioribus; inferioribus parvis, adscendentibus, acutis.* ♂. *Exp. alar.* 15—19 *mm.*

Ad Jokstuen *in alpibus Dovrensibus die* 24 *Julii à Dom.* Siebke *lectus mihique donatus.*

L. extricato *et* L. hirsuto *affinis, et minor, notisque suprà exhibitis abunde diversus. Fœminam nondum vidi.*

LIMNOPHILUS HYALINATUS.

Alis anticis pallide ferrugineis, diaphanis, costis obscurioribus, puncto vitreo ad thyridium, maculisque obscurioribus irregularibus atque obsoletissimis cellularum apicis, maris de cetero unicoloribus, fœminæ vero macula solita fenestrata obsoleta, maculaque vitrea sat magna sed obsoleta ad anastomosin in cellulis apicis 3—6; *cellula discoidali scapo plus quam duplo longiore, cellulaque dorsi exteriore ad initium cellulæ illius non extensa; alis posticis vitreis, apice flavicante, cellula discoidali scapo haud longiore furcaque cubiti fere contra medium cellulæ illius incipiente; appendicibus analibus maris superioribus edentatis, productis, a latere visis latis, inferne late excisis, apicibus obtusis, exsertis et decurvatis, a tergo visis gracilioribus, ad basin distantibus, sensim decurvatis, apicibus fere contiguis; intermediis brevibus, atris; inferioribus latis, brevibus, adscendentibus, superne truncatis, margine tenui nigro.* ♂ ♀. *Exp. alar.* 30—32 *mm.*

Ad Jokstuen *in alpibus Dovrensibus Norvegiæ a Dom.* Schöyen *repertus mihique benevole donatus.* L. pantodapo *affinis, sed colore appendicibusque diversus.*

LIMNOPHILUS RHANIDOPHORUS.

Pedibus testaceis, femoribus fuscis; alis anticis fuscis, punctis minutissimis pel-

lide vitreis, rarioribus, præsertim in parte apicali et ad marginem anteriorem sparsis, punctoque pallide vitreo majore ad thyridium, ad arculum, et ad basin cellularum apicalium 1, 3, 5 ; *cellula discoidali scapo longiore, cellulaque dorsi exteriore ad initium cellulæ illius non extensa; posticis vitreis, apice obscuriore, cellula discoidali scapo longiore, furcaque cubiti contra tertiam partem cellulæ illius incipiente; segmento dorsi octavo apice obtuso nec producto; appendicibus dualibus maris superioribus productis, elongatis, a latere visis latis, margine superiore modice arcuatis, margine inferiore exciso, apice obtuso, a tergo visis ad basin haud distantibus, sensim divergentibus, sed apicibus incurvatis, fere contiguis; appendicibus reliquis haud discernendis.* ♂. *Exp. alar.* 30 *mm.*

Ad Jokstuen *in alpibus Dovrensibus Norvegiæ a Dom.* Schöyen *captus.* L. fuscicorni *affinis. An* Phryganea fumigata, Germar, *vera?*

STENOPHYLAX THEDENII.

Pedibus totis testaceis coxisque concoloribus; alis anticis griseo-testaceis, ad marginem interiorem et in parte posteriore pallide fusco-irroratis, puncto vitreo ad arculum et ad thyridium; cellulis apicis 1^{ma} *et* 5^{ta} *ad basin obliquis,* 2^{da} *et* 4^{ta} *truncatis, illa latiore,* 3^{ia} *angulata, cellula discoidali scapo nonnihil longiore; posticis vitreis, furca cubiti contra partem tertiam cellulæ discoidalis incipiente, cellulis apicis ad basin latis,* 2^{da} *omnium latissima,* 1^{ma} *et* 5^{ta} *longissimis, æqualibus, obliquis,* 3^{ta} *angulata,* 2^{da} *et* 4^{ta} *truncatis; appendicibus analibus maris superioribus latis, a tergo visis subquadrangularibus et connatis, a latere visis obtusis, margine exteriore oblique truncato; intermediis brevissimis, subtriangularibus, nigris; inferioribus latis, adscendentibus, brevibus, margine exteriore arcuato, margine superiore oblique truncato, crenulato, nigro, angulo acuto, nonnihil exserto.* ♂. *Exp. alar.* 28—30 *mm.*

E Lapponia Sueciæ inferiore, sed exemplum ad Holmiam a Dom. Thedenio *captum etiam ad hanc speciem sine dubio referendum, etsi alæ anteriores haud fusco-irroratæ appareant. In exemplo illo typico, margo alæ anterior usque in cellulam discoidalem irroratione fusca caret. Species* S. fusorio *affinis.*

Farhult Sueciæ : *Martii*, 1879.

Notes on butterflies observed in the Valais in 1878.—During the early part of last summer, in company with my friend, Mr. P. L. Sclater, F.R.S., and party, I spent about three weeks in the Valais of Switzerland, and, during that time, we devoted a considerable part of our energies to butterfly-catching. As the two valleys where we spent the greater part of our time are rather out of the beaten track of tourists, and have possibly not been visited by English entomologists before, I think a few notes on our captures may be worth inserting in this Magazine. The valleys visited, the Vals d'Hérens and d'Anniviers, are two of the lateral valleys which run from the main chain of the Pennine Alps into the Rhône Valley, debouching into it between the better known valleys of Chamounix and Visp.

In the Val d'Hérens, we made Evolena (about 4,500 ft. above the sea) our head quarters, staying there a week, and making excursions thence higher up the valley, including a two days' stay at Arolla, at the head of the valley of the same name, a most lovely spot (about 6,500 ft.), close to the Glacier d'Arolla, and overshadowed by many magnificent snowy peaks, such as Mont Collon, the Dent d'Hérens, and

others. Unfortunately, the weather at this period was not propitious, but, one beautiful day in the Val d'Arolla, showed what might have been done with better weather. From the Val d'Hérens we went over the Col du Torrent (about 8,000 ft.) into the Val d'Anniviers, where we spent a week at Vissoye (about 4,500), and from there, after an ascent of the Bella Tola (10,000 ft.), Sclater decending the other side to the Turtman Thal, returned to Sierre, whence I returned home, viâ Brieg and Paris, whilst Sclater continued over the Furka and thence home by Lucerne, obtaining thus a few additional species

The time (from about June 25th to July 15th) was probably, on the whole, as good as any we could have chosen, though certainly too early for the highest ranging species. The weather was only moderately good, fine and wet days being in about equal proportion. Nevertheless, we managed to see or capture in that time 83 species of butterflies, and brought back about 600 specimens of these, as well as about 150 *Heterocera*, more than double that number of *Coleoptera* and *Hemiptera*. In the present notes, however, I only notice the *Rhopalocera*, not having as yet determined fully the other groups. I may perhaps mention, to show the abundance of butterflies in the Alps under favourable circumstances (*i. e.*, on a fine day), that one day (July 6th), at Vissoye, we captured (or saw) no less than 45 distinct species, and on two or three other days, both there and in the Val d'Arolla, the number observed exceeded 40. In the following list I have only enumerated the more interesting species, and have followed Dr. Staudinger's catalogue (1871) throughout.

Papilio Machaon—only a few specimens, occurring singly in various localities, but never very high up. *Parnassius Apollo*—common about Vissoye, also a few at Evolena and in the Arolla Valley; this species flies slowly and steadily, but, if alarmed, goes off at a great pace, and is not then easily caught: *P. Delius*—this species occurred, flying with the last, in the Val d'Arolla, and was rather abundant on the slopes of the Col du Torrent, above the Val d'Hérens; both it and *P. Apollo* vary much in the size, number, and intensity of the red ocelli and spots; this species is not found so low as *P. Apollo*, not, according to our experience, much below 6,000 ft.: *P. Mnemosyne*—this species occurred with the last in the Val d'Arolla, and on the Col du Torrent; the curious ovisac, with which, in this genus, the females are provided, is, in *P. Mnemosyne*, much larger than in the other two, and of a white colour; all the three species frequent the wetter slopes on the sides of the valleys: the occurrence of *three* species of this genus together in exactly the same locality, as was the case at one point in the Val d'Arolla, is certainly very remarkable, considering the resemblance in habits of the different forms. *Aporia cratægi*—one of the most abundant butterflies in Switzerland, and extending some height up. *Pieris napi, ab.* ♀ *bryoniæ*—a few in the Val d'Arolla, and on the Col du Torrent and Furka, with males of the ordinary form; specimens vary considerably in darkness: *P. Callidice*—not common in the Arolla Valley, especially at Arolla itself, and a few on the Col du Torrent, Furka, and Bella Tola at high elevations (8,000 ft. or so); the flight of this species resembles that of a *Colias*, more than that of our ordinary English whites. *A. Belia, var. simplonia*—this species occurred with the last in the Val d'Arolla, and was rather numerous in the meadows outside the inn there. *Leucophasia sinapis*—very common at Evolena and elsewhere. *Colias Phicomone*—a few of this mountain species in the valley at Evolena, but commoner on the slopes around and higher up the valley towards Arolla; also on the Furka and Bella Tola. Thecla *rubi*—two or three specimens at various places; on the Bella Tola at about 6,500 ft. *Polyommatus virgaureæ*—males very common in the valley at Vissoye, also in the Turtman Thal and near Zinal, but I only saw a single female; one male from Vissoye is remarkable for being of a yellow colour above: *P. Hippothoë, var. Eurybia*—this alpine form of *Hippothoë*, from which it differs in the duller colours of the male, and in the female being almost unicolorous brown above, and greyer beneath; occurred sparingly at Evolena, more commonly at Vissoye, where it occurred with *P. virgaureæ*, and also on the St. Gothard route, between Andermatt and Amsteg: *P. Dorilis, var. subalpina*—two specimens, one at Evolena, the other on the Bella Tola; of the alpine form of *Dorilis*, which differs from the type in being unicolorous above, and with no redness beneath. *Lycæna argyrotoxus* (*Ægon*)—this blue swarmed in the lower part of the Val d'Arolla, rising in crowds from the muddy water in the roads, &c. *P. Argus*—I secured two specimens from amongst the crowds of the last, and doubtless passed over many more; will somebody explain why, in two such closely allied species, one (*Ægon*) should possess, the other (*P. Argus*) want, the "hornstachel" on the fore tibiæ: *P. Eumedon*—rather common at Evolena, and one on the Furka. *L. Escheri*—two specimens, one in the upper part of the Val d'Anniviers, coming down from the Col du Torrent, and another at Evolena: *L. Corydon*—Evolena, Zinal, &c., and one, remarkable for the brightness of its blue, which approaches that of *Bellargus* (*Adonis*), at about 6,500 ft. on the Bella Tola: *L. Hylas*—several at Vissoye, and also occurred at Evolena and in the Val d'Arolla, but only one female: *L. Damon*—only one, a male, above Evolena: *L. minima* (*Alsus*)—very common; I was surprised to see our little "Bedford blue," so local an insect in England, in the Alps at elevations of 6-7,000 ft., as at Arolla and on the Col du Torrent; also on the Furka: *L. semiargus* (*Acis*)—common at Evolena, Vissoye, Arolla, &c.: *L. Alcon*—rather common at Evolena, and one at Vissoye: *L. Arion*—occurred at every place we visited. *Limenitis populi*—a single specimen of this fine species in the river-valley at Vissoye sitting on the poplars, and safely secured by Sclater. *Melitæa Cynthia*—Sclater secured a single male of this species on the Furka; we were probably too early for it elsewhere: *M. Aurinia, var. Merope*—a single specimen at Arolla, one in the Turtman Thal, and a fine series from the Furka: *M. cinxia*—Vissoye, Evolena, &c., common: *M. Phœbe*—Evolena, Val d'Arolla, and common about Vissoye and at Sierre. *M. didyma*—common at Vissoye and Sierre: *M. Dictynna*—fairly common at Evolena, Vissoye, Arolla, &c.: *M. Athalia*—common, Evolena, Vissoye, Arolla, &c.: (*M. Parthenie*—one at Lausanne). *Argynnis Pales*—one at Arolla, and tolerably numerous at high elevations (7-8,000 ft.) on the Col du Torrent and Bella Tola; also occurred on the Furka, and between Andermatt and Amsteg; we did not see the *var. Arsilache*: *A. Dia*—one at Sierre: *A. Amathusia*—fairly common at Vissoye and Evolena, in damp places along the valleys: *A. Ino*—with the last: *A. Lathonia*—one near Vissoye: *A. Niobe, var. Eris*—one at Vissoye, others on the St. Gothard route; we did not see *Paphia* or *Adippe*: *A. Aglaia*—rather common. *Erebia Epiphron* (the form *helamus*?)—sparingly in the higher parts of the Vals d'Herens and d'Anniviers; also on the Bella Tola, Furka, and the St. Gothard route: *E. Ceto*—very common in the valley at Evolena, and a few elsewhere: *E. Stygne*—this species also abounded at Evolena, but occurred higher than the last, frequenting, not the meadows near the river, but the rocky slopes at the side of the valley; also sparingly at Arolla, Zinal, in the Val d'Anniviers, and on the St. Gothard; nearly every specimen is a male: E. glacialis, *var. Alecto*—a single specimen of an *Erebia* which I saw at the end of the Arolla Glacier (about 7,000 ft.), and, after a hard run over the stones of the terminal *morraine*, secured, turns out to belong to this species: *E. lappona*—this species had the highest range of any, according to our experience; it occurred tolerably common about the higher slopes of the Col du Torrent, and also on the top of the pass (about 8,000 ft.); in descending from the Bella Tola I caught one specimen on the snow at about 9,000 ft., and saw others at nearly the same elevation; it was common on the Furka: *E. Tyndarus*—this species we only met with on the Col du Torrent, at from about 6,500 ft. upwards; it was not common: *E. Ligea* ?—I believe that several *Erebias*, from Evolena and Vissoye, are referable to the true *Ligea*: *E. Euryale*—being common at Vissoye and Evolena, in the valleys, and a few in Arolla Valley and the Furka. *Chionobas Aëllo*—I caught two specimens in the Val d'Arolla, at about 6,000 ft., and afterwards another in the Val d'Anniviers at the foot of the Col du Torrent, at about the same elevation; Sclater found it commonly on the Furka, and secured both sexes. *Satyrus Hermione*—this fine species was common about Vissoye, particularly frequenting the slopes of some dry rocky ground in the valley, exposed to the sun; it has a sailing *Sibylla*-like flight; also in the Turtman Thal: *S. Actæa, var. cordula*—this species was also common at Vissoye, occurring in the same localities as the last, but nearly all caught were males. *Pararge Mæra*—this is one of the commonest butterflies in the Swiss valleys, at moderate heights; it loves to rest on the surfaces of rock overhanging the roads, and on walls, &c., exposed to the sun, starting out moderately like a grayling, the grey under-surface matching well with it chosen haunts: *P. Hiera*—we were apparently too late for this species, only securing a few worn specimens in the Val d'Hérens, between Evolena and Arolla. *Cœnonympha Satyrion*—this pretty little "heath" was common at Arolla on damp ground, but also occurred more sparingly around Arolla, in the Turtman Thal, on the Col du Torrent, and on the St. Gothard route; the males were much commoner than the more brightly coloured females. *Syricthus carthami*—not common; a few in the Val d'Anniviers, at Arolla, Vissoye, and Zinal: *S. alveus* ?—Vissoye and on the Bella Tola, but I am not sure that the specimens are rightly determined, owing to the difficulty of this group: *S. cacaliæ*—sparingly at Vissoye and Evolena, but tolerably common at higher elevations on the Col du Torrent, the Bella Tola, and Furka: *S. Sao*—one at Vissoye. *Nisoniades Tages*—abundant, flying over wet ground, at Arolla.—W. A. Forbes, St. John's College, Cambridge: 16*th February*, 1879.

Von Harold's remarks on Japanese Hydrophilidæ.—Herr von Harold, in his Beiträge zur Käfer-fauna von Japan (Berl. ent. Zeit., 1878, p. 69), gives a note on these insects, which seems likely to cause a good deal of confusion to those who may follow it. He suggests that *Megasternum distinctum*, Sharp, may probably be the same as Motschoulsky's *Pachysternum hæmorrhoum*; though it would be difficult to suppose, he adds, that such a sufficient observer should have overlooked the absence of emargination on the front tibiæ. This is a curious remark for such an accurate naturalist as von Harold to make, for, in my description of *M. distinctum*, I said expressly that it "has the anterior tibiæ simple at the extremity."

This oversight of Harold's is accompanied, however, by a second equally great one, *viz.*, that Motschoulsky expressly states that *P. hæmorrhoum has* the front tibiæ *emarginate! His* words are "Forme ovalaire attenuée des *Cryptopleurum*, mais avec *les jambes antérieures* échancrées sur leur face extérieure."

Von Harold's remarks had better therefore be withdrawn or explained. But I may observe that when I made my description of *M. distinctum* I compared the insect with Motschoulsky's descriptions and came to the conclusion that it was not *P. hæmorrhoum*; and I see, on again going over the question, no reason to doubt that I was right in my conclusion: independently of the quasi-generic differences of the two, Motschoulsky's diagnosis of *P. hæmorrhoum* is quite inapplicable to *M. distinctum* in two points, viz., "pedibus piceis," and "elytris . . . interstitiis basi convexis." Farther, I think that Harold had not my *M. distinctum* before him when he wrote the remarks above alluded to, for his phrase, "Thorax sehr fein punktirt," is not applicable to my insect. The probability seems to be that Harold's supposed *P. hæmorrhoum* is a species still in need of a name.

It may not be amiss to add that Harold, in his remarks on *Cercyon Sharpi* (*l.c.*), has mistranslated my statement about the tibiæ of *C. dux*. I said (Trans. Ent. Soc., 1873, p. 65) "allied to *C. littoralis*, but has the anterior tibiæ simple at the extremity." Harold says, however, that I remarked that "*dux* has the front tibiæ unarmed" ("unbewaffnet"). Such, however, was not my meaning. Actually, in *C. dux* the front tibiæ are armed externally with very short setæ or spines; the tibiæ are dilated at the extremity, and their outer angle is extremely rounded, and the lower part is densely set with very short spines, among which may be perceived two longer, but yet quite short teeth. This structure can only be distinctly recognised when recently developed specimens are examined, for the fossorial habits of the species cause the front tibiæ to be much worn and altered, by the grinding down of the spines and edges. By using the term "simple at the extremity" I did not at all intend to refer to the armature of the outer edge, but to the fact that the tibiæ in *C. dux* show no trace at all of the prolongation and narrowing of the apical portion which gives the appearance of an emargination at the extremity in *C. littoralis*. I think, however, that *C. Sharpi* will prove not to be synonymic with *C. dux*.

Harold cites also, in the same paper, *Cyclonotum orbiculare*, L., as a Japanese species, and adds that *C. breve*, Sharp, is certainly the same species. Here again I must differ from him. He goes on to add that in the European specimens of *C. orbiculare* the palpi are of a reddish-yellow colour. This is, however, not the case, and I suspect Harold's error arises from his not having distinguished the south European *C. hispanicum* from the more northern *C. orbiculare*. I think if Harold will go over the matter again he will perhaps agree with me in considering *C. orbiculare*, *C. hispanicum*, and *C. breve* as distinct, although very closely allied species. The North American *C. globulosum*, Kl. (*rotundatum*, Dej.), is another of these closely allied forms, and there are others in various parts of the world, even in tropical Africa, and in Australia, all of them presenting an extraordinary similarity in size, form, and appearance, so that by a hasty observer they would easily be called "all one species," but, when careful examination is made, structural differences may be found to corroborate the slight distinctions of the more superficial characters.—D. SHARP, Thornhill, Dumfries: 31*st March*, 1879.

Note on Homalota egregia, Rye.—There can, from the description, be no doubt that *Liota hypogæa*, E. Mulsant and Cl. Rey, is identical with this species. I do not know for certain which name will stand; my species was described in the number of this Magazine published on 1st January, 1876; Mulsant's was described, as new, in the Annales de la Société Linnéenne de Lyon (n. s.), xxii (for 1875, with date 1876 on title), p. 191. But if, as is most likely from the extreme confusion attending the multiple publications of these authors, the insect is also their Aleuonota hypogæa, described as new in Opuscles Entomologiques. xvi, p. 175, and included in the Zoological record for 1875, vol. xii, p. 299, my species must fall.—E. C. Rye, 70, Charlwood Road, Putney: *April*, 1879.

A species of Aphodius new to Britain.—I have for some years had separated in my collection some examples of an *Aphodius*, near *inquinatus*, which are evidently *A. melanostictus*, Schüpp., Er. Compared with *inquinatus*, the majority are conspicuously larger, with more developed limbs, and the gronnd colour of a darker testaceous colour, *the sides of the thorax entirely reddish-testaceous*, and the black streak in the second interstice of the elytra reaching further towards the middle. In all but one of my specimens also, the black line connected with this streak is carried towards the apex and connected in the lower third with the lateral black line, which is not the case in any of my varieties of *inquinatus*. The specimens are from the Manchester district.—Id.

Insects at Zanzibar.—[Mr. Joseph Thomson, of the Royal Geographical Society's African Expedition, has sent to his friends in Scotland some notes on the Island of Zanzibar; amongst them are the following entomological extracts, which will no doubt interest the readers of the Ent. Mo. Magazine.—D. Sharp.]

"In our walk to the woods, we cannot but be astonished at the absence of beautiful butterflies. In all my perambulations I have as yet only seen three large species, although there are innumerable small forms. The dragon flies make up somewhat for the scarcity of the former; these voracious beings are in great abundance, many of them of large size and great beauty; I have caught more than thirty species, and I have seen as many more, which I have not yet captured. Entering the woods, our attention is attracted by the huge millipedes, 6 or 8 inches in length, wriggling amongst the branches, and the equally large land snails (*Achatinæ*) with shells half a foot in length, crawling with steady pace along the banana leaves. Looking up to the mango trees, a curious nest-like object formed of leaves drawn together is noticeable, which suggests the idea that they are nests of the tailor bird; but, on going near to examine, we are filled with surprise to find them swarming with large ants; in fact, they are the nests of these wonderful little creatures. If you disturb them, you will find that they well deserve the name of mago-moto (fire water) which they receive here. Further on our attention is drawn from tree gazing by the cry of our guide, 'siafa, siafa' (ants, ants), and looking to the ground, a broad band of what appears to be motionless ants is seen extending across the path. On closer examination, the band, to our astonishment, resolves itself into a tunnel of these creatures, through which the others are pouring in apparently endless multitudes. The unwary pedestrian, who unwittingly tramps on this tunnel, will find, to his agony, that his trousers have been converted into a channel up which they rush, and, with a fiendish vengeance, they will let him know that they are not to be touched with impunity.

"In our long delightful walk, night has surprised us, and warns us to turn our backs on the malaria of the damp ground. The tepe-tepe has hushed its tooting, and is replaced by the more sombre sounds of the owls. The goat-sucker flits about like an uneasy spirit, and a large owl-like frugivorous bat hovers here and there over a mango tree. The deafening music of the *Cicadæ* is in full force, with all its marvellous ringing of bells, jingling of rings, and whistling of steam engines, while the frogs in the marshes add to the din by their incessant clatter from a thousand throats. In the hedges and amongst the trees, fireflies, like little shooting stars of earth, glance and scintillate through the murky gloom, recalling old legends and stories of fairies and elfs."

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ERRATA.

Page 76, line 18 from bottom, *for* "*T. melanoptera*, white," *read* "*T. melanoptera*, White."
„ 129, „ 29 „ top, *for* "*hepatieus*," *read* "*hepaticus*."
„ 154, „ 10 „ bottom, *for* "parts although," *read* "parts. Although."
„ 192, lines 2 & 3 from top, *for* "p. 387 à 393," *read* "p. 151 à 172."
„ *253, line 2 from* bottom, *for* "last," *read* "second."
„ „ *last line, dele* "only."
Pages 231—233, for "Eupelix," *read* "Eupelex," the original Greek derivation being correctly given by Germar.

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